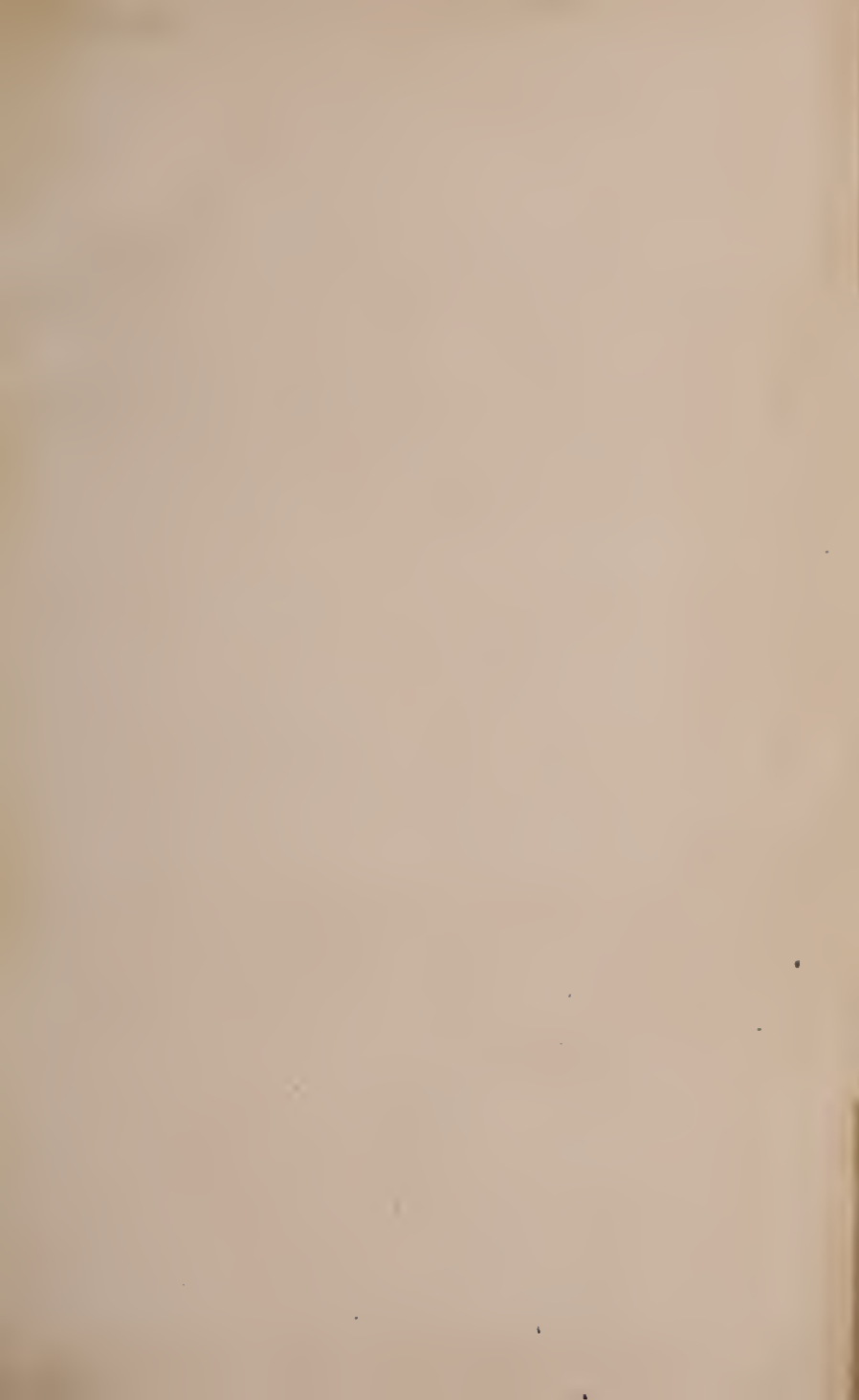


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Journal of the Asiatic  
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THE JOURNAL  
OF THE  
ASIATIC SOCIETY  
OF  
BENGAL.

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VOL. VIII.  
JANUARY TO DECEMBER, 1839.  
NEW SERIES.

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"It will flourish, if naturalists, chemists, antiquaries, philologists, and men of science, in different parts of *Asia* will commit their observations to writing, and send them to the Asiatic Society in Calcutta; it will languish, if such communications shall be long intermitted; and will die away, if they shall entirely cease."—SIR WM. JONES.

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## PREFATORY NOTICE.

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The acting Secretaries have this day the honour to submit to the Asiatic Society, and to the Subscribers to the Journal so long connected with that Institution, the first number of a *new series*.

On the sudden departure of the late inestimable Secretary, Mr. JAMES PRINSEP, much difficulty arose as to the continuation of the Journal, he so long and so admirably managed. While no member of our Society could lay claim to Mr. Prinsep's universality of attainments, or presume to enter, without self-distrust, on even a portion of his pursuits, almost all were already over-burthened by official or professional duties. Some were deterred, moreover, by the considerable pecuniary risk which the management of the Journal involved. Under such circumstances it was arranged that the Rev. Professor MALAN, of Bishop's College, in association with Dr. O'SHAUGHNESSY, should continue the Journal at the risk of the latter. But this plan was defeated *in limine* by the illness of Mr. Malan, and the necessity of his proceeding to the Cape.

Mr. J. C. C. SUTHERLAND having been appointed to act as Joint-Secretary with Dr. O'Shaughnessy, during Mr. Malan's absence, has consented, however, to under-

take the management of the part of the Journal devoted to Oriental literature and antiquities. On his colleague will devolve the supervision and arrangement of matters relative to Natural History and General Science. The Editors propose no alteration in the plan of the work. It will be their constant aim to imitate Mr. Prinsep in the discharge of their editorial duties. It will be their indescribable pride, should they succeed in sustaining the high rank to which he elevated his Journal among the most distinguished periodicals of the day.

But the Editors have no desire to conceal their apprehensions of the possible failure of this attempt. Both may without affectation describe themselves as men having a full share of responsible occupation. The hours of a scanty leisure are all they can assign to this new care, nor have they in themselves the inexhaustible resources which enabled Mr. Prinsep to fill up so perfectly, whatever deficiency any department of the Journal might experience. Thus circumstanced, they would fain call on the Members of the Asiatic Society, for the good name of that respected body, as well as for the public utility, to exert themselves to support, nay to preserve, this Journal. Such exertion will be the best token of respect and gratitude to Mr. Prinsep—a feeling in itself enough to induce all to contribute their contingents, however trifling, in furtherance of the pursuits, which under the constant patronage of the Asiatic Society, he cultivated with such extraordinary success.

The Editors have pleasure in stating, that in the important departments of Oriental Geography, Modern



Dialects, Statistics, and Natural History, they are already amply supplied with most valuable materials. To Colonel STACY and his gallant companions with the Army of the Indus, they look with confidence for numerous contributions in the History and Numismatology of the interesting countries on the route of the Candahar expedition. In fine, the Editors entertain sanguine hopes of still preserving the "Journal" for the Society, and the Public, provided the old contributors participate in some degree in their anxiety to accomplish this object. As a claim on the co-operation of those who have hitherto been so instrumental in maintaining the character of this Periodical, the responsible Editor assures the Subscribers that any pecuniary returns which may exceed the expenses, will be devoted to increasing its bulk, improving its quality, and adding to the number of its illustrations. The Work is thus the property and benefit of a "Joint Stock Company," of which the Editors are but the honorary, though anxious servants.

\* \* \* Contributors are deemed entitled to 50 copies of their papers, which will be forwarded, bearing postage, by letter or banghy dāk wherever they direct. Copies of the Journal are dispatched by each Overland Mail to the leading Periodicals in Europe and America.

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# JOURNAL

OF

## THE ASIATIC SOCIETY.

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No. 85.—JANUARY, 1839.

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ART. I.—*A Grammar of the Pashtoo, or Afghánee Language. By*  
LIEUT. R. LEACH, *Bombay Engineers, Assistant on a Mission.*

*To the Secretary to the Asiatic Society.*

Political Dept.

SIR,—I am directed by the Honorable the President in Council to forward to you the accompanying Grammar of the Pashtoo or Afghán Language, compiled by Lieutenant Leach, for such notice as the Society may deem it to merit.

2. I am further directed to request that the Grammar in question may be returned when no longer required.

I have the honor to be,

Sir,

Your most obedient humble servant,

H. T. PRINSEP,

*Secy. to the Govt. of India.*

*Fort William, 20th Feb. 1839.*

---

This language is called Afghánee or Avghánee by Persians and other foreigners, and Pashtoo, Pukhtoo, and Pastoo, severally, by the Afgháns of Candhar, Peshawar, Teerai, and by the Afreedees, Khy-beerees, &c. &c.

The language is decidedly of Sanscrit complexion, from the frequent occurrence of the ष *jh* and क् *kgh*; indeed these two letters with the Devnagary उ compose the peculiarity of the language.

The difference between the Peshawar and Candhar dialect is, that in the former the Persian *خ* is used, when in the latter the Sanscrit *घ* occurs.

The Candharee is reckoned the purest dialect ; and when correctly spoken, resembles in the plaintiveness of its tones the peculiar dialect of Ireland.

*The Alphabet is as follows.*

<i>Afghánee.</i>		<i>Devna- gary.</i>		<i>English.</i>		<i>Pronunciation.</i>
ا	...	अ	...	a	...	as the second <i>a</i> in parable,
ب	...	ब	...	b	...	as the English,
پ	...	प	...	p	...	Ditto, ditto,
ت	...	त	...	t	...	as the Continental <i>t</i> ,
ث	...		...	th	...	as <i>th</i> in things,
ټ	...	ट	...	t	...	as the English <i>t</i> ,
ج	...	ज	...	j	...	as the English <i>j</i> ,
چ	...	च	...	ch	...	as the English,
ح	...		...	h	...	as the aspirated <i>h</i> ,
خ	...		...	kh	...	as <i>ch</i> in the Scotch loch,
ج	...		...	z	...	the Afghan <i>z</i> used for coupling,
د	...	द	...	d	...	the Continental <i>d</i> ,
ذ	...		...	th	...	as <i>th</i> in those
ر	...	ड	...	d	...	the harsh English <i>d</i> ,
ر	...	र	...	r	...	the English <i>r</i> ,
ر	...	ड़	...	d	...	the peculiar Maratha <i>d</i> ,
ز	...		...	z	...	the English <i>z</i> ,
ژ	...		...	j	...	the French <i>j</i> in jour,
س	...	स	...	s	...	the English <i>s</i> ,
ش	...	श	...	sh	...	the English <i>sh</i> ,
ښ	...	ष	...	jh	...	unknown in English,
ص	...		...	s	...	the Arabic <i>dwàd</i> ,
ض	...		...	dz	...	the Arabic <i>dzwàd</i> ,
ط	...		...	t	...	the Arabic <i>t</i> ,

*The Alphabet (Continued.)*

<i>Afghánee.</i>	<i>Devna-</i>	<i>English.</i>	<i>Pronunciation.</i>
	<i>gary.</i>		
ظ	...	z	... the Arabic z,
ع	...	ẖ	... the Arabic mark for guttural vowels,
غ	...	gh	... the Persian guttural,
ف	फ	f	... the English f,
ق	...	k	... the harsh English k,
ک	क	k	... the English k,
گی	ग	g	... the English g,
ل	ल	l	... the English l,
م	म	m	... the English m,
ن	न	n	... the English n,
و	व	w	... the English w, or v,
د	ह	h	... the English h,
ی	य	y	... the English y,
س	क्ष	kg	... the Sanscrit.

The same story is told of the *Afghán* language, that the Mah-rattas tell of the Canarese, viz., That a certain king sent his vizier to collect all the vocabularies and dialects of the earth; on the vizier's return he proceeded to quote specimens before his royal Master: when he came to speak of the *Afghánee* dialect, he stopped, and producing a tin pot containing a stone, began to rattle it. The king in surprise asked the meaning of this proceeding. The vizier said that he had failed to get a knowledge of the *Afghánee* language, and could only describe it by rattling a stone in a tin pot.

It is also said, that Mahammad, the Arabian prophet, gave it as his opinion that the *Afghánee* was to be the language of the infernal regions, as Arabic was to be that of heaven.

In the comparison of languages, in which Arabic is called science, (*ilm*); Turkish *accomplishment*, (*hunar*); Persian *sugar*; Hindustanee *salt*; the *Afghán* is complimented with the appellation of the "braying of an ass."

An Afghán is immediately discovered by another by the correctness with which he distinguishes between a masculine and feminine noun.

*Declension of a Noun Masculine.*

	<i>Singular.</i>	<i>Plural.</i>
Nominative	ás, a horse	asán, horses
Genitive	da ás, of a horse	da asáno, of horses
Accusative & Dative .... }	ás ta, a horse	asánoo ta, horses
Ablative	la ás, from a horse	la asánoo, from horses

*Declension of a Noun Feminine, ending in a Vowel.*

	<i>Singular.</i>	<i>Plural.</i>
Nominative	aspá, a mare	aspe, mares
Genitive	dá aspá, of a mare	da aspo, of mares
Accusative & Dative .... }	aspeta, a mare	aspota, mares
Ablative	la aspe, from a mare	la aspo, from mares

*Examples of forming the Feminine from the Masculine Noun.*

<i>Masculine.</i>	<i>Feminine.</i>
spe, dog	spai, a bitch
khar, a donkey	khara, a she-ass
buz, a he-goat	buza, a she-goat
gid, a fat-tailed ram	gida, a female sheep
orará, nephew	orerá, niece
tara, uncle	tarala, aunt

*Declension of a Compound Noun.*

	<i>Singular.</i>	<i>Plural.</i>
Nominative	gha sadai, a good man	gha sadee, good men
Genitive	da gha sade, of a good man	da gha sadee, of good men
Acc. & Dat.	gha sade ta, a good man	gha sadota, good men
Ablative	la ghasade, from a good man	la gha sadee, from good men

*Declension of the 1st Personal Pronoun.*

Nom.	za, I	muj, we
Gen.	zmá, mine.	zmuja, ours
Acc. & Dat.	málá, me.	mujla, us
Abl.	la má, from me.	la muj, from us

*Declension of the 2nd Personal Pronoun.**Singular.*

Nom.	ta,	thou
Gen.	stá,	thy
Acc. & Dat.	tálá,	thee
Abl.	la tá,	from thee

*Plural.*

táso,	ye
istáso,	yours
tásolá,	you
la taso,	from you

*Declension of the 3d Personal Pronoun—proximate.*

Nom.	daghá,	this	dagho,	these
Gen.	da de,	these	da deev,	of these
Acc. & Dat.	dela,	this	deevla,	these
Abl.	la de,	from this	la deev,	from these

*Declension of the 3rd Personal Pronoun—remote.*

Nom.	haghá,	that	hagho,	those
Gen.	da haghá,	of that	da hagho,	of those
Acc. & Dat.	haghá ta,	that	hagho ta,	those
Abl.	la haghá,	from that	la hagho,	from those

*Declension of the Reflective Pronoun.*

Nom.	Pakhpul,	I myself
Gen.	Akhpul,	my own
Acc. & Dat.	... ..	wanting
Abl.	... ..	ditto

*Declension of the Interrogative Pronoun—animate.**Singular.*

Nom.	sok,	who
Gen.	da chá,	whose
Acc. & Dat.	chá ta,	who
Abl.	la chá,	from whom

*Declension of the Interrogative Pronoun—inanimate.*

Nom.	sa,	what
Gen.	a sa,	of what
Acc. & Dat.	sa la,	why
Abl.	la sa,	from what



*Cardinal Numbers.*

1	you	11	you las
2	dwá	12	dwá las
3	dare	13	dyar las
4	salor	14	swár las
5	pinz	15	pinz las
6	shpaĵ	16	shpadas
7	avo	17	olas
8	atha	18	athlas
9	nah	19	nolas
10	las	20	shil
21	you visht	31	you dergh
22	do visht	32	do dergh
23	dre visht	33	dre dergh
24	salerisht	34	salor dergh
25	pinzvisht	35	pinz dergh
26	shpaĵ visht	36	shpaĵ dergh
27	ovisht	37	o,o dergh
28	athvisht	38	ath dergh
29	novisht	39	nah dergh
30	dergh	40	salweght
41	you salweght	51	you pinzost
42	doo salweght	52	doo pinzost
43	dre salweght	53	dre pinzost
44	salor salweght	54	salor pinzost
45	pinz salweght	55	pinz pinzost
46	shpaĵ salweght	56	shpaĵ pinzost
47	o,o salweght	57	o,o pinzost
48	ath salweght	58	ath pinzost
49	nah salweght	59	nah pinzost
50	pinzast	60	shpeta
61	you shpeta	71	you avyà
62	doo shpeta	72	doo avyà
63	dre shpeta	73	dre avyà
64	salor shpeta	74	salor avyà
65	pinz shpeta	75	pinz avyà
66	shpaĵ shpeta	76	shpaĵ avyà
67	o,o shpeta	77	o,o avyà
68	ath shpeta	78	ath avyà
69	nah shpeta	79	nah avyà
70	avyà	80	atyà



81	you atyá	91	you nawee
82	doo atyá	92	doo nawee
83	dre atyá	93	dre nawee
84	salor atyá	94	salor nawee
85	pinz atyá	95	pinz nawee
86	shpaĵ atyá	96	shpaĵ nawee
87	oowa atyá	97	oova nawee
88	ath atyá	98	ath nawee
89	nah atyá	99	nah nawee
90	nawee	100	sil
1000	zil		1,00,000 lakh

kror 1,00,00,000

*Ordinal Numbers.*

1st	yawam	6th	shpaĵam
2nd	doowam	7th	owam
3rd	dreyam	8th	atham
4th	salaram	9th	naham
5th	pinzam	10th	lasam, &c.

*Conjugation of the Auxiliary Verb (masculine.)*

*Indicative Mood.*

*Present Tense.*

*Singular.*

*Plural.*

1st Person,	zaiyam, I am	muĵ yoo, we are
2nd	taiye, thou art	táseyást, you are
3rd	hagha, dai, he is	haghádee, they are

*Perfect Past Tense.*

*Singular.*

*Plural.*

1st Person,	zawum, I was	muĵ woo, we were
2nd do	ta we, thou wast	tási wást, you were
3rd do	haghá woo, he was	haghá woo, they were

*Imperfect Past Tense.*

*Singular.*

*Plural.*

1st Person,	za kadam, I was being	muĵ kedoo,
2nd do	ta kede	tási kedást,
3rd do	haghá keda	haghá keda,

*Pluperfect Past Tense—HAD BEEN.*

1st Person	za sawai wam	muĵ siwee woo
2nd do	ta suwai wee	tasi siwee wást
3rd do	haghá sawai woo	hagha siwee woo

*Future Tense*—SHALL BE.

1st Person,	zakeajam	muĵ keajam
2nd do	ta keaja	tási keajai
3rd do	haghá keajee	hagho keajee

*Imperative Mood.*

ta sa, be thou	tasi sai, be you.
----------------	-------------------

*Subjunctive Mood.**Present Tense*.—MAY BE.

1st Person,	zawam	muĵ woo
2nd do	ta we	tasi wást
3rd do	haghá see	hagho soo

*The Relative Conjugation* IF is expressed by KA.*Perfect Past Tense.*

1st Person,	za wai	muĵ wai
2nd	ta wai	tási wai
3rd	haghá wai	hagho wai

*Infinitive Mood* KEDA, "BEING," OR "TO BE."*Past Participle*, SAWAI WOO, "BEEN."*Conjugation of the Verb* WAIYIL, "to speak."*Present Tense.**Singular.**Plural.*

1st Person,	za waiyam	muĵ waiyoo
2nd do	ta wai	tasi waiya'st
3rd do	hagha wai	hagho wai

The feminine gender only changes the 1st Person Singular, as a woman says, *za waiyama*.

*Perfect Past Tense.*

1st Person,	ma' waiyil	muĵ waiyil
2nd do	ta' waiyil	ta'si waiyil
3rd do	hagha' waiyil	hagho waiyal

*Imperfect Past Tense.*

1st Person,	ma' waiyil	muĵ waiyil
2nd do	ta' waiyil	ta'si waiyil
3rd do	hagha' waiyil	hagho waiyil

*Pluperfect Past Tense.*

1st Person, má waiyalaiwo	muj waiyaleewoo
2nd do. tá wo waiyil	tási waiyaleewoo
3rd do. haghá waiyalaiwo	hagho waiyalai woo

*Future Tense.**Singular.*

1st Person, za bawowaiyam
2nd ditto ta bawowaiye
3rd ditto haghá bawowai

*Plural.*

muj bawowáyoo
tási bawowaiyast
hagho bawowai

*Imperative Mood.*

ta wawáya	tási wowáyast
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*Subjunctive Mood.**Present Tense.*

1st za wowáyam	muj wowáyoo
2nd ta wowáye	tasi wowáyast
3rd haghá wowáyee	hagho wowáyee

*Perfect Past Tense.*

1st ma waiyalaiwoo	muj waiyaleewoo
2nd tá waiyalaiwoo	tási waiyaleewoo
3rd haghá waiyalaiwoo	hagho waiyaleewoo

*Adverbs, Post- and Pre-positions, Conjunctions, &c. &c.*

porta, above	sarangá, how
kghata, below	bul jalá, again
danana, in	os, now
dabánde, out	biyá, afterwards
dilta, here	makh á mukh, in front
halta, there	bas, enough
de khawa, on this side	ham, also
haghá khawá, on that side	ho, yes
doudande, before	nah, no
douroosta, behind	makava, don't
jirr, quickly	ka, if
ro ro, slowly	pára, sake of
man rwaz, to-day	wodya, gratis
paroon, yesterday	az, than
sabhá rwaz, to-morrow	o, hollá
ba, till	sarra, with

mudám, always  
kala, when  
cherta, where

wo, and  
ya, or  
belá, without  
wale, but

*Vocabulary of Nouns.*

rwaz, day,	ás, horse,	yaĵ, bear
shpa, night,	aspá, mare,	bizo, monkey
halak, boy,	osai, deer,	sarkaza, hog
zoe, son,	khar, ass,	bza, she-goat
ĵilai, girl,	ghàtar, mule,	waz gadai, he-goat
loor, daughter,	behan, colt,	murghumai, kid
peghla, maid,	yaboo, poney,	mej ewe
plár, father,	chirg, fowl,	maĵ, ram
mor, mother,	chirga, hen,	warg maĵ, fighting ram
uror, brother,	kaftara, pigeon,	dusherlá, middling ram
khór, sister,	gidada, fox,	psherlai, ram
oba, water,	chaghál, jackal,	wuchkulai, ram
or, fire,	koĵ, hyena,	urai, lamb
dode, bread,	spai, dog,	ghwa, cow
ghahar, city,	pishec, cat,	ghwáyai, bull
kalai, hamlet,	muĵak, mouse,	sukhwanda calf
kiĵde, tent woollen	chughuka, sparrow	
kor, house	oogh, camel	
khoona, room	ghannum, wheat	
ghole, a yard	wurijjee, rice	
wanai, tree	urbushee, barley	
bootai, bush	nakhud, pulse	
tirkh, brushwood	phascolus, maximus	
niár, snake	pyáz, onion	
tá ooz, peacock	tanzire, partridge	
zirká, Greek partridge	kurak, quail	
luja, leak	thalla, sole of foot	
gazir, carrot	warghawe, palm of hand	
malkhaze, thyme	punda, heel	
anár, pomegranate	padkai, ancle	
hindwáná, water melon	pandai, calf	
inana, apple	zangoon, knee	
meda, man	khwale, perspiration	
ghaza, woman	pgha, leg	
niándiná, female	waroon, thigh	
niáreená, male	nas, belly	

málgá, salt	kunatai, bullock
tel, oil	tatar, beast
ghodee, ghee	lās, hand
shakar, sugar	oja, shoulder
marach, pepper	sha, back
largai, wood	ghádá, neck
kuchce, butter	shund, lip
hagge, an egg	ghágh, tooth
shide, milk	ziune, chin
maste, curds	bárkhoo, cheek
shalumbe, butter-milk	paza, nose
lástai, pestle	saĵme, nostril
khat, bedstead	stirgha, eye
tiltak, coverlid	bánoo, eye-lash
bálight, pillow	waridza, eye-brow
nihále, bed	tandai, forehead
ospana, iron	ghwaj, ear
surp, lead	partookh, trousers
mio, copper	partoogagh, breeches string
kál, year	ozgár, idle
zyad, brass	pagde, turban
myasht, month	khaĵ, sweet
sirazar, gold	turwá, sour
speen zar, silver	muĵh, nail
tirkha, bitter	spaĵme, moon
garm, hot	store, star
sod, cold	wáh, woo, wind
klak, hard	garz, dust
narm, soft	zoná, light
porta, } high	tyárá, darkness
boad, }	angoor, grapes
garan, dear	oma, raw
arzán, cheap	paĵha, cooked
spuk, light	shkar, horn
duroond, heavy	swa, hoof
wach, dry	changul, divided hoof
noombd, wet	wadai, wool
zulf, lock of hair	pumba, cotton
tsoonee, woman's hair	jibba, language
bret, mustacheos	ghwajai, hunger
jeera, beard	tajai, thirst
arkh, armpit	kough, shoes

tirkhe, armpit	chaplai, slippers
kund, widow	doond, blind
oghke, a tear	gung, dumb
meda, husband	koon, deaf
ghaza, wife	god, lame with both legs
dároo, gunpowder	rást, straight
purod, grass	koj, crooked
ghalla, grain	tsappa, upset
speen, white	lewânai, mad
soor, red	khapa, angry
tor, black	ranzoor, ill
ábee, blue	starai, tired
zyad, yellow	dard, pain
sheen, green	lár, road
mahee, fish	safar, journey
ghwashe, meat	noom, name
lmar, sun	zeen, saddle
rikeboona, stirrups	kad wasai, great grandson
mulooná, bridle	kosai, great great grandson
ghar, hill	zoom, son-in-law
seen, river	warindára, sister-in-law
khight, brick	orara, nephew
nikka, grandfather	orerá, niece
wurr nikka, great grandfather	tra and aka, uncle
masai, grandson	tróree, aunt

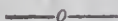
### *Vocabulary of Verbs.*

rátalal, to come	talal, to weigh
tlal, to go	ve pemawal, to measure
rávdal, to bring	pakhawal, to cook
odal, to carry away	khlas wal, } to open
pátakedal, to place	wáz wal, }
odaradil, to rise	paránatal, }
porta kawil, to raise	tadal, to blind
kgheenastan, to sit	parkawal, to cut
akhistan, to take	seere kawal, to tear
wenissa, to seize	mátawal, to break
khudal, to eat	zghastal, to run
chghil, to drink	lwastan, to read
zbeghil, to suck	girzedal, to stroll
chichil, to bite	skawul, to pull
ghwkhán, to chew the cud	pákawal, to wipe



jō owal, to chew  
 khandil, to laugh  
 jadil, to weep  
 wahal, to beat  
 jagli } to call  
 kawal }  
 skandal, to pinch  
 gandal, to sew  
 beredal, to fear  
 tukhedal, to cough  
 teláwul, to push  
 ghakhá wal, to press  
 lād eghwurzawul, to spit  
 ghwul kawal, to ease one's self  
 leedal and katal, to see  
 tisháwul, to employ  
 bázee kawal, to play  
 waiyil, to speak  
 wuruk kawal, to lose  
 mudal, to die

purewatal, to fall  
 zejal, to bring forth  
 purawal, to borrow  
 por warkawal, to lend  
 put wal, to conceal  
 ghakhauwal, to bury  
 zij dedal, to tremble  
 kháls wal, to loosen  
 garawul, to scratch  
 togawul, to pour  
 pookawul, to blow  
 mityaze }  
 kawal, } to make water  
 dakawul, to fill [ment  
 jaghawul, to play on an instru-  
 lirekawal, putting away  
 mzaka kandan, to dig  
 pághal, to sow  
 waswa, to burn



*Sentences and Dialogues.*

*The Afghán Salutation—"ROGH BOD."*

Jod e gha táze gha khushal e gha } Are you well ? quite fresh ? quite  
 raghale ? } happy ? welcome ?

Answer. Jha wose pa khair wose } May you be well. May all be  
 makhwár reje. } right with you. May you ne-  
 ver be badly off.

Sta noom sa de ?

What is your name ?

Ta soke ?

Who are you ?

Kum yánye ?

Who is there ?

Tási chare zai

Where are you going ?

Tási la kum zae rágháliyást

Whence come you ?

Dwa myásht me sooeedee chi la } It is two months since I came  
 Candhára rághale yam } from Candahar.

Dá lár da Shikarpoor de ?

Is this the road to Shikarpoor ?

Za khabar neyam pakhpula mu- } I don't know, I am myself a tra-  
 sapor yam } veller.

Lár waghaiya

Shew the road.

Tsa khabrá la Bádsháh ávaradi- } Have you heard any news of the  
 leeyast ? } king ?

- Wai ee chi Shikarpoor ta wara } They say he has arrived at Shi-  
seda. } karpoor.
- Da Hinduwáno pa kághaz kghe } What was the news from Herat  
da Harát da báбата tsa kglie- } in the Hindoo's letter ?  
lawoo?
- Kshilawoo da kajar tag o da Kam- } It was written that the Persians  
ran chapáw pa Farrah bándé } had retired, and that Kamran  
oda Mahammad Siddeek Khán } had made a descent on Farrah,  
bandee wodal. } and taken away Mahammed  
Sideek Khán prisoner.
- So rwaze soo,ee dee chi Kásid la } How many days is it since a Cos-  
Loodiáne rághale de ? } sid arrived from Loodiana ?
- Ka za durwágh zam na gham pinz } If I remember right it is five days.  
rwaze soo i dee }
- Wale jar ra naghale ? Why have you not come quickly ?
- Ma psheen spashan } I will go out riding by afternoon  
prayers.
- Za be khartsa yum muwajam me } I have no money, will you give  
ráka ? } me my pay ?
- Madar woka chi da hinde mudda } Wait till the bill of exchange be  
poorá see } due.
- Dode zmá da para pakhaka chi } Get ready dinner for me, as I am  
wujee yum chi wakhutam } hungry and have an appetite.
- Tsa bara sta zoe zma deedan lara } What's the reason your son does  
ranághai ? } not come to see me ?
- Sa lara da kár na kave ? Why don't you do that ?
- Tasta sawe ? What is become of you ?
- Ka za spansee darkam dá shpāj } If I give you ready money, what  
kameesa pa tso mazdoorce ba } will you take for making six  
jod ke ? } shirts ?
- Da ghar moom laree ka na laree } Has this mountain a name or not ?
- Sardarán da Candahár chi dee pa } The Sardars of Candahar when  
wakht da mukadame chi da } they want to get money from  
cha tsakha tsa ghwadec akhpul } any one in time of need, are in  
da ourate psol wa haghá sadec } the habit of pawning their wives  
ta giroje kghee dec } jewels
- Akhpul maindina biya wo poo- } They instruct their wives to get  
hawce chi byá pa sand tara da- } the jewels out of pawn by a  
khpul psol bidta zeenee rávdá } contrivance of their own.
- Pa Candahár ki jha ás tsa keenruet } What is the price of a good horse  
laree ? } in Candahar ?
- Gha ás pa salor souwa pa lás razee } A good horse can be got for 400 Rs.
- Deráwat tso zara rupo, ee mályá } What is the revenue of Derawat  
laree } in thousands ?
- Dergh zara rupo, ee mályá laree } It is a revenue of 30,000 Rs.



Sháh Shuja chi raghalai woo Sar- dárán tola razá woo chi ghar warkee baghair la you Sardár Kohn Dil Khánchi waigil chi zma sar dai o da Kalá Kungre	} When Shah Shuja appeared, all the Sardars were content to give up the city except Kohn Dil Khán, who said, my head with these parapets.
Tási arvedalai dai chi da Maham- mad Shah aká Shikarpoor lare raghalai dai?	} Have you heard the uncle of Mahammad Sháh has arrived in Shikarpoor?

—o—

*Specimen of Afghan verse from Abdul Rahman.*

Har matloob chighwaje tá, uka da rabab	} When the musician turns the screw of the Rebeck
Padá táuk jhee zma zada kandee kabab	} By each turn that is made my heart is burnt.
Chi saiye panaghma pa taránash- um	} When I pay attention to the tune and the tone
Dewána sham grewantsiree most okhráb	} I get mad, and tear my clothes frantic and lost.
Hame tár hame guftar hose as ar- ka	} The strings and burthen of the song so distress me
Chi hetsok na takat laree na tab	} That none could bear it orendure it.
Youve sáz, bulawáze da belto	} Let there be music first, then the theme of absence,
Dream shaar paraghaz ka intikháh	} Third, let a poet recite his good verses,
Tsalaram you sakeeye tar sangk- ghenee	} Fourth, let a cupbearer be near
Che makh na mahtáb li dilaivee na áftáb	} Who has never been looked on by sun or moon—
Da talor wáda fitne dee pa tslor kunja	} These four are four traitors in four corners—
O pinzame suráeedai da mai nab spajame wakt da noubahar o da zawancee	} And the fifth be a bottle of the best wine, and the sixth the time of the new spring and youth,
Ou owam shughal da bayazoda kitáb	} And the seventh reading of al- bums and books.
Chidá hoomree áfatoona sara tol shee	} If all these wonders be collected together
Turo tsok saranga zeenee kande ijtanáb	} Who can deliver himself from them ;
Chi dá hasee dilbarán par as ar- naka	} He who is not affected by any of these rarities
Ya ba devee yá deewaz dai yádaw ab	} Must be either more than human, a wall or a beast.

Da tsargand bashee parhez da par- hez ga	} Here the abstinence of abstainers will be discovered
Kakádar shee pa spahade pa shráb	} When they be surrounded by love and wine.
Za Rahman lareeyá zohida pana ghwadam	} May God defend Rahman from hypocrisy ;
Dareeyá zohad ázáb de hamitab	Hypocrisy is trouble and reproach.

(True Copy)

H. TORRENS,

(Signed) R. LEACH.

Depy. Secy. to the Govt. of India.

With the Govr. Genl.

ART. II.—SISUPA'LA BAD'HA, or death of SISUPA'LA by MA'GHA.  
Translated, with Annotations, by J. C. C. SUTHERLAND, Esq.

—o—

Book I.—The conference between KRISHNA and NA'RADA.

Salutation to the fortunate GANESA !

श्रियःपतिःश्रीमतिशासितुंजगज्जगन्निवासोवसुदेवसद्गनि ।  
वसन्ददर्शावतरन्तमम्बराद्विरण्यगर्भाङ्गभुवंमुनिंहरिः ॥१॥

1. HARI, husband of SRI, dwelling in the fortunate abode of VASUDEVA, to reform the world, though himself the abode of worlds, saw descending from the sky, the sage, who sprang from a portion of the being, that was conceived in the golden mundane egg.

द्विधाकृतात्माकिमयंदिवाकरोविधूमरोचिःकिमयंकृताशनः ।  
गतन्तिरश्चीनमनूरुसारथेःप्रसिद्धमूर्ध्वज्वलनंहविर्भुजः ।  
पतत्यधोधामविसारिसर्वतःकिमेतदित्याकलमीक्षितंजनैः ॥२॥

2. Is this the Sun itself parted into two orbs? Is it fire shining with light divested of smoke? The motion of the luminary whose charioteer has no legs is curvilinear. The ascent of flame is a well known property of fire. What is this, which descends diffusing light around? Thus was the sage contemplated by wonder by the people.

चयस्त्विषामित्यवधारितं पुरातनः शरीरीति विभाविता कृतिः ।  
विभुर्विभक्तावयवंपुमानितिक्रमाद्भुनारद इत्यवोधि सः ॥३॥

3. The sagacious hero gradually recognized him. First, he remarked a mass of light; then, perceived an organic shape; next, discerned the human form; and, lastly, knew him to be NĀRADA.

नवानधोऽधोवृहतः पयोधरान्समूढकर्पूरपरागपाण्डुरं ।  
क्षणं क्षणोत्क्षिप्तगजेन्द्रकृत्तिनास्फुटौपमं भूतिसितेन शुम्भुना ॥४॥

4. Who, gray like a heap of levigated camphor, clearly resembled for a moment (whilst close under vast fresh clouds,) SAMBHU whitened with ashes, and clad in the skin of a mighty elephant thrown over [his shoulder].

दधानमग्भोरुहकेशरद्युतीर्जटाः शरच्चन्द्रमरीचिरोचिपः ।  
विपाकपिङ्गास्तुहिनस्थलीरुहोधराधरेन्द्रं व्रततीततीरिव ॥५॥

5. Who, shining like the Moon in the sultry season, and wearing braided locks, yellow as cream, and splendid like the filaments of the lotus, resembled the king of mountains covered with multitudes of twining plants that thrive in the region of snow.

पिशङ्गमौञ्जीयुजमर्जुनच्छविं वशानमेणाजिनमञ्जनद्युतिं ।  
सुवर्णसूत्राकलिताधराम्बरां विडम्बयन्तं सिति वाससस्तनुं ॥६॥

6. Who, brilliantly white, girt with a yellow cord made of hyacinthoid alectris, and clad in the skin of a black antelope, shining like antimony, mocked the person of the hero, conspicuous by his black apparel, fastened to a golden cord.

विहङ्गराजाङ्गरुहैरिवायतैर्हिरण्मयोर्वीरुहवलितन्तुभिः ।  
कृतोपवीतं हि न शुभ्रमुच्चकैर्धनं वनान्तेतडिताङ्गुणैरिव ॥७॥

7. Who, white as snow, and wearing for a scarf a string made of the fibres of climbing plants, gathered from the golden soil, and long like the down on the body of the king of birds, resembled a cloud streaked with flashes of lightning, in the season in which clouds become unfrequent.

निसर्गचित्रोज्ज्वलसूक्ष्मपद्ममणालसद्विसच्छेदसिताङ्गसङ्गिना ।  
चकासतंचारुचमूर्चर्मणाकुथेननागेन्द्रसिवेन्द्रवाहनं ॥८॥

8. Who, seemed the king of elephants that bears INDRA, ornamented with trappings made of the beautiful skin of a spotted deer, covered with hair, delicate, glossy, and naturally variegated, decorating a body white like the slips of the stalk of a lotus.

अजस्रमास्फालितवत्सकीगुणक्षतोज्ज्वलाम्भुष्ठनखांशुभिन्नया ।  
पुरःप्रवालैरिवपूरितार्द्रयाविभान्तमच्छस्फटिकाक्षमालया ॥९॥

9. Who held a rosary of clear crystal beads, but seemingly half filled with coral beads, in front being divided by the rays, emitted from the nail of his thumb, reddened by the strings of his lute continually struck by him.

रणङ्गिराघट्टनयानभस्वतःपृथग्विभिन्नश्रुतिमण्डलैःस्वरैः ।  
स्फुटीभवद्गामविशेषमूर्च्छनामवेक्षमाणमहतामुज्जुर्मुज्जुः ॥१०॥

10. Who looked again and again at his lute surnamed "the large," wherein the rising and descending melodies of various octaves became distinct, by musical notes, which consist of different sets of measured sonorous lengths, and which were separately sounded by the impulse of the breeze.

निवर्त्यसोऽनुब्रजतःकृतानतीनतीन्द्रियज्ञाननिधिर्नभस्वतः ।  
समासदत्सादितदैत्यसंपदःपदमहेन्द्रालयचारुचक्रिणः ॥११॥

11. That Treasure of Knowledge, which is possessed by such as have subdued their passions, dismissing the inhabitants of the sky, who followed him with humble salutations, alighted at the house of him who is armed with a discus, and has stript demons of their conquests, an abode elegant like the palace of INDRA.

पतत्पतद्गप्रतिमस्तपोनिधिःपुरोऽस्ययावन्नभुविष्यलीयत ।  
गिरेस्तडित्वानिवतावदुच्चकैर्जवेनपीठादुदतिष्ठदच्युतः ॥१२॥

12. The devout saint, an image of the descending Sun, was not yet standing before the immortal hero, when he hastily rose from his lofty throne, like a thunder-cloud from a mountain.



अथप्रयत्नोन्नमितानमत्फलैर्धृतेकथञ्चित्फणिनांगणैरधः ।

न्यधायिषातामभिदेवकीसुतंसुतेनधातुश्चरणोभुवस्तले ॥१३॥

13. The son of DHĀTRĪ alighted before the son of DEVAKĪ, and as the feet of the saint touched the surface of the earth, it was hardly upheld by multitudes of serpents underneath, who bowed, in despite of their exertions to raise their dilated necks.

तमर्ह्यमर्घादिकयादिपूरुषःसपथ्ययासाधुसपथ्यपूजत् ।

गृहानुपेतुंप्रणयादभीप्सवोभवन्तिनापुण्यवतामनीषिणः ॥१४॥

14. The primeval being shewed due honour to that venerable person with an *arghya* and other ceremonies; for wise persons enter not, with complacency, the houses of them who do not perform the sacred rites of civility.

नयावदेतावुदपश्यदुत्थितौजनस्तुषाराञ्जनपर्वताविव ।

स्वहस्तदत्तेमुनिमासनेमुनिश्चिरन्तनस्तावदभिन्यवीविशत् ॥१५॥

15. Ere the people observed them, as they stood rivalling mountains of snow and of antimony, the primeval sage had made the saint sit down in front of him on a seat presented with his own hands.

महान्महानीलशिलारुचःपूरोनिधे दिवान्कंसकृषःसविष्टरे ।

श्रितोदयाद्रेरभिसायमुच्चकैरचूचुरच्चन्द्रमसोऽभिरामतां ॥१६॥

16. Sitting on a lofty throne before the foe of KANSA (who shone like a vast sapphire) the sage exhibited the beauties of the Moon resting on the orient mountain opposite to the dusk at eve.

विधायतस्यापचितिंप्रसेदुषःप्रकाममप्रीयतयज्जनांप्रियः ।

ग्रहीतुमाथ्यान्परिचर्यथामुज्जर्महानुभावाह्निनितान्तमर्थिनः ॥१७॥

17. The being who is dear to pious votaries, pleased the saint by special honour shewn to him as he sat down; for the wise delight in repeatedly conciliating venerable guests by respectful treatment.

अशेषतीर्थोपहृताःकनुडलोर्निधायपाणावृषिणाभ्युदीरिताः ।

अघौघविध्वंसविधौपट्टीयसीर्नतेनमूर्द्धाहरिरग्रहीदपः ॥१८॥

18. HĀRI bowed his head as he received the fluid poured into his hands by the sage from a gourd, which contained water collected from every holy stream, and most efficacious to remove all taint of sin.

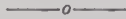
सकाच्चनेयचमुनेरनुज्ञयानवाम्बूदश्यामवपुन्यवि क्षत  
जिगायजम्बूजनितश्रियःश्रियंसुमेरुशृङ्गस्यतदातदासनं ॥१८॥

19. The golden throne on which the hero, whose body was black like a fresh cloud, sat down at the bidding of the saint, surpassed the beauty of the cliff of *Sumeru*, embellished as it is by the fruit of the *Eugenia*.

सतप्तकात्तस्वरभाश्वराम्बरः कठोरताराधिपलाङ्कनच्छविः ।

विद्युतेवाडवजातवेदसःशिखाभिराश्लिष्टवाम्भसांनिधिः ॥२०॥

20. Resplendent like the orb of the Moon, and clad in apparel that equalled the lustre of tried gold, he resembled the ocean embraced by the flames of submarine fire.



#### ANNOTATIONS—BOOK I.

V. 1. BRAHMA was born in an egg bright as gold (Menu, e. i. v. 9.) and from his hip sprang NARADA. KRISHNA being an incarnation of VISHNU bears the titles of that deity; the name HARI, and the attribute of pervading and containing the universe are therefore given to him, at the same time that he is mentioned as the son of VASUDEVA. His wife RUKMINI is in like manner considered as an incarnation of SRI or LUKSHMI. In the original, SRI is the first word of the couplet, purposely introduced there as an auspicious beginning of the Poem.

V. 2. The first part of this triplet is an interpolation. The Scholiast leaves it unnoticed. ARUNA is the dawn, or the Charioteer of the Sun, and is figured without lower extremities.

V. 3. The sagacity of KRISHNA is here meant to be contrasted with the stupid wonder of the people.

V. 4. On certain festive days SIVA dances before his wife PARVATI.

V. 5. The mineral anjana that used for collyrium is here meant.

V. 6. BALARAMA, brother of KRISHNA, derives several of his titles from the black apparel constantly worn by him.

V. 7. VISHNU's bird named *Garuda*, is surnamed King of Birds. The down on his body is figured as much larger than that which is observed in his kindred of royal vultures.

The King of Vultures, if the bird usually so named were meant by Sir William Jones, (As. Res. vol. vi. p. 129), has been described as a native of America and the West Indies. The Pandits of Behar suppose the gigantic crane to be the *Garuda*.

V. 8. The spotted Axis is the species of deer alluded to in this place. *Airavata*, surnamed King of Elephants, bears INDRA, the sovereign of demi-gods. He is figured white like the royal elephants of Ava.

V. 9. NARADA being an ascetic is painted as here described, with a rosary in one hand, and his Indian lute in the other, his hair braided like an anchorite, his complexion fair, and his body covered with ashes, a sacerdotal string by way of scarf, a yellow cord round his waist, and the skin of an antelope on his shoulders.

V. 10. NARADA's lute, surnamed *Mahati* or "the large," SARASWATI's is called "*Kuchhapi*" (testudo), as VISWAVASA's *Frihati* or "the best," and TUMBURU's "*Kalavati*."

The dissertation of Sir W. Jones, on the musical notes of the Hindoos, may be consulted (A. R. vol. iii. p. 45). *Murchana* is here rendered according to the passage quoted by the Scholiast from a musical treatise. "The ascent and descent of the seven notes in due order are called *Murchha*." There are seven in each octave, and consequently twenty-one in the three octaves.

V. 11. The knowledge of God is attained by completely subduing worldly appetites. The discus is KRISHNA's weapon of offence.

V. 13. DHATRI is a title of BRAHMA. DEVAKI was mother of KRISHNA. In the infernal regions vast serpents, analogous in figure to the common Naga, are supposed by Hindu mythology to uphold the world on their dilated necks.

Their sensation of NARADA's weight as he alighted, is termed by the Scholiast a beautiful exaggeration.

V. 14. Water with rice and grass presented to a guest in an oval vessel is named *Arghya*. It is one of the most auspicious ceremonies at the solemn reception of a guest.

V. 15. Primeval sage, like primeval being in the preceding verse, is a title of VISHNU, applied like all other titles and attributes of that deity, to KRISHNA.

V. 16. KANSA was slain by KRISHNA. The Scholiast cites a passage from AGASTYA where sapphires (if this gem be really meant by the Sanscrit terms *Maha Nila* and *Indra Nila*) are described as produced in mines in the island of *Sinhala* or *Silan*.

The earth is supposed by Hindu poets and mythologists to be terminated by mountains. The Sun rises from behind the eastern range, and sets behind the western.

V. 18. NARADA, like other ascetics, bears a gourd by way of water-pot; making continual pilgrimages he had attached water from every holy river or lake.

V. 19. In conformity with the opinion of the Scholiast, *Jumbu* is here taken for the fruit of the *Eugenia*, which when ripe is of a very dark colour; but *Jumbu* is also the name of a river which flows from the mountain *Sumeru*.

V. 20. The notion of submarine fire may be founded on volcanic phenomena observed in ancient times.

ART. III.—*On the Geographic Distribution of Birds, but more particularly of the European Species; with a critical examination of Mr. Swainson's account.*<sup>1</sup> By WM. JAMESON, ESQ., Bengal Medical Service.

The advantages to be derived from a study of the geographic distribution of the organic and inorganic kingdoms, as presented to our view at the present day, are of the greatest importance, seeing that until this subject has been properly examined, that of a former world must remain imperfect; and probably if more attention had been paid to it, many of the numerous errors connected with the distribution of fossil animals would not have been committed. Lately the foot-marks of birds<sup>2</sup> have been discovered in a formation said to be as old as the new red sandstone; and the author, from an examination of these marks, has not only been able to point out the genus, but even characterise the species. The presumption in doing this, is scarcely

<sup>1</sup> Read to the Wernerian Natural History Society of Edinburgh.

<sup>2</sup> Prof. Hitchcock in Sillim. American Journ. of Science.

worthy of attention. Cuvier from an examination of the internal skeleton of birds, declared that it was, in many instances, impossible to tell the genus, far less than the species. Let us, therefore receive with caution such observations, even although they have been considered as plausible by several of the leading geologists.<sup>1</sup> We examined the casts of those so called foot-marks, in the collection of the Royal College of Surgeons of London,<sup>2</sup> but were not at all convinced of their ornithological origin, and till we have further evidence than such impressions, we would be inclined to argue the contrary; for we are as much, or rather more, entitled to infer that they are only vegetable impressions.<sup>3</sup> To find the remains of birds in such a formation as the new red sandstone would invalidate one of the grand principles of geology.

In tracing out the geographic distribution of the animal and vegetable kingdoms, various methods have been adopted. Some authors, as Humboldt and Latreille, have attempted to trace them according to parallels of longitude and latitude; others, as Illiger,<sup>4</sup> Fischer,<sup>5</sup> &c., according to the various Continents—which no doubt is the most unobjectionable method; for we find, that when the former is properly examined, it will not stand the test of minute examination, seeing that we have in each of the individual Continents great groups entirely confined, and which have no representatives in any other of the other Continents under similar degrees of longitude and latitude, as we ought to find, if the views of Humboldt, &c. were correct.

Till the laws which regulate the distribution of both the organic and inorganic kingdoms are explained, such a method can never be adopted. We no doubt find secondary causes, such as light, heat, moisture, greater or less distribution of water, configuration of the land, exercising a powerful influence, which is particularly marked out in certain quarters of the globe; and from authors looking to these individual places alone, they have put more stress upon these causes than what we are entitled to do. Thus, for example, in Northern India, where we find the climate in some places to resemble so much the European, we have a large series of quadrupeds, birds, insects, plants, &c. either identical with the European, or undergoing such slight modifications, as to entitle them to be considered as mere local varieties, or at least the representatives of the European species.<sup>6</sup>

1 Buckland's *Bridgewater Treatise*.

2 For liberty to examine these we were indebted to Mr. Owen.

3 Our reasons for coming to such a conclusion we shall afterwards give.

4 *Abh. d. Akad. d. Wiss. Zu. Berlin*. 1806, p. 236 et 1812 a. 13, p. 221

5 *Synopsis Animalium et Conspect. Distribut. Geographicæ*.

6 Vigers, *Zool. Proc Pt. i.* pp. 7, 22, &c. Gould's *Cent. of Birds*. Wils. Cab. Lib. India, vol. iii. p. 78. Jameson, Wern Trans. in *Ed. New Phil. Jour*



But although these secondary causes seem to have a certain influence in some places, yet that is far from being universal, all appearing to be subject to some great principle hitherto undiscovered, and which will probably remain for ever so.

Nor is it alone in the organic kingdom that we find the distribution liable to vary from unknown causes. In the mineral kingdom we observe phenomena of a similar nature. Thus we find, as has been well remarked, "the geographical distribution of minerals to be very different from mountain rocks; we do not find the same species everywhere, on the contrary, they seem to have many kinds of distribution, in this respect approaching more nearly to what we observe in the physical arrangement of animals and vegetables on the surface of the earth."<sup>7</sup>

It is foreign to our purpose at present to give all the methods which have been proposed by Humboldt, Latreille, Fabricius, Swainson, &c. in order to point out the erroneous grounds upon which they are based, but shall at present confine our attention to that one most recently given, viz. by Swainson; and as he has entered into some detail, in regard to the birds of one of his divisions, allowing us an opportunity of refuting his statements, we shall therefore direct particular attention to it; we are the more induced to do so, as no person has ventured to point out the erroneous views of this author, which seem to have been based upon a few and unsatisfactory data.

By Mr. Swainson the globe has been divided into a series of zoological regions or provinces, denominated, 1st. the European or Caucasian; 2d. Asiatic or Mongolian; 3d. the American; 4th. the Ethiopian or African; and, 5th. the Australian or Malay. In the European or Caucasian province he includes the whole of Europe properly so called, with part of Asia Minor and the shores of the Mediterranean. In Northern Africa, he states, the zoological peculiarities of this region begin to disappear; they are lost to the eastward of the Caucasian mountains, and are blended with those of Asia and America to the north. 2. The Asiatic range comprehends the whole of Asia east of the Ural mountains, which form a natural and well defined barrier between the two Continents. The chief seat of this zoological region is, he states, probably in Central Asia; its western confines blend into the European towards Persia, and disappear in the west of the Caucasian chain; it is united to the African range among the provinces of Asia Minor, and is again connected with Europe, and also with America, by the arctic regions of the three Continents; finally, its

<sup>7</sup> Jameson, Werner Trans. Annals of Phil. vol. vi. p. 301.

most southern limits are marked by the islands of Java and Sumatra, where the zoological characters of the Australian regions begin to be apparent. 3. The American province, he states, is united to Europe and Asia at its northern limits, and comprehends the whole of the New World, but into which it blends at the other extremity is uncertain. 4th. The African province. In it he includes the whole of Africa south of the Great Desert; part, at least, of the countries on the Mediterranean exhibits a decided affinity to the European range; while the absence of large animals in Madagascar, and the presence of genera peculiar to New Holland and the extreme point of Southern Africa, lead us to the fifth, or Australian range. 5. Australian province. Australia, New Guinea, and the neighbouring islands, mark its limits in that direction; Australia Proper is its chief seat, and it spreads over the whole of the numerous islands in the Pacific Ocean; and he moreover remarks, whether this province blends with that of America or Europe, remains for further discovery; but its connexion with Africa and Asia has been already intimated. That the zoology of each of the individual Continents blend with each other at their junction, is a fact that never once has been questioned; but with regard to Madagascar forming the connecting link between Australia and the African Continent, Mr. Swainson can claim no originality in this statement, seeing that it was several years before the publication of Mr. Swainson's elaborate work, pointed out by M. Lesson;<sup>8</sup> and it is a remarkable fact that lately several animals considered truly African have been detected in New Holland,<sup>9</sup> and, on the other hand, several pouched animals, which tribe were supposed to be peculiar to New Holland and America, have been discovered in Madagascar.

The divisions which Mr. Swainson has proposed, appear at first sight very plausible; but when thoroughly inquired into, will not bear the test of examination. Thus to arrange under one and the same division the Continents of North and South America, Mr. Swainson has taken for granted what nobody has admitted, or can admit, viz. that the geographic distribution of birds is subject to the same laws as those which regulate man.<sup>10</sup> Upon this argument the whole of his divisions seems to be founded, which is quite at variance with all that is yet known in regard to the geographic distribution of animals. In fact, there is no ground whatever for such an argument; nor have we any evidence whatever, on the other hand, to maintain that

<sup>8</sup> *Annal. de Science Nat.*    <sup>9</sup> *Proceedings of Zool. Soc. of London.*

<sup>10</sup> The divisions adopted by Mr. Swainson being in accordance with the views of Dr. Pritchard in regard to the distribution of man.

man is liable to be influenced by the same physical laws as those which act upon the lower animals.

If we take into consideration the Continents of North and South America, we shall find them fully as well, if not better, marked out as zoological provinces—at least South America—than any of the others enumerated by Mr. Swainson. Thus among the *Mammalia* in South America, we find, the genera *Priodon*, *Apara Encoubertes*, *Dasyprocta* *Hydrochaerus*, *Cælogenys*,<sup>10</sup> &c. entirely confined; and in regard to the ornithological kingdom, the genera *Pipra*, *Rupicola*, *Alector*, *Crax*, *Penelope*, *Dicholophus*, *Crotophaga*, *Rhamphastos*, *Rhea* *Tanagra*, *Trochilus*, &c. are almost entirely unknown in the Northern Continent. No doubt a few extend their migrations as far north as Mexico; and of the family *Trochilidæ*, or Humming-Birds, four are found throughout the Continent of North America; two<sup>11</sup> of these however must be considered as accidental. One, the *Trochilus colubris*, extends as far north as the 57° or 58° on the west coast,<sup>12</sup> it also frequents the warm plains of Saskatchewan, and Mr. Drummond found its nest near the sources of the Elk river. It advances towards the north as the season lengthens, and delays its visits to the Northern States till the month of May, and still as remarked by Nuttall, as if determined that no flower shall blush unseen, or waste its sweetness on the desert air, it launches at once on wings as rapid as the wind, without hesitation, into the flowery wilderness which borders on the arctic circle.<sup>13</sup> Another species, *Trochilus rufus*, first discovered by Captain Cook at Nootka Sound, hence denominated the Nootka Sound Humming-Bird, has a much more extensive range, having been found by Kotzebue as far north as the 61° parallel of latitude on the Pacific coast; and there are specimens in the Edinburgh Royal Museum of the same species from Mexico. Specimens have also been observed by Swainson from the same quarter, being killed near Real del Monte. In the *Trochilus (ornismya) sephanoides*, Less. we see a similar distribution in the Southern Continent, it having been discovered by Captain King at the Straits of Magellan, and in honour of whom it has been named the *Melisuga Kingii* by Vigors,<sup>14</sup> although erroneously, for it does not at all differ from

10 For the different genera of quadrupeds proper to the two continents of America, see Illiger. Loc. Cit. Fischer. Loc. Cit., and Richardson's excellent Report on North American Zool. in Trans of Brit. Asso. vol. v. for those found in North America.

11 Audubon's Amerc. Ornith.

12 Nuttall's Amerc. Ornith. vol. ii. p. 635.

13 Nut. vol. i. p. 585.

14 Zool. Journ.

Lesson's species,<sup>15</sup> who is quite correct in giving this name as a synonym. Lesson's specimen was received from Chili, and in the Edinburgh Museum there are several specimens, one of which was received by Professor Jameson from Mexico. The occurrence of Humming-Birds and Parrots in such high southern latitudes was long ago pointed out by Cook. His observations, however, were called in question, and denied by Buffon, but happily found to be quite correct by King.<sup>16</sup> But are four species, two of which are accidental visitors, to be considered equivalent to nearly one hundred which are confined to the Continent of South America?<sup>17</sup> The same applies to the *Tanagers*; for of the three species found in North America, one alone is proper to it, the other two being also found in South America. The species we allude to, are the *Tanagra rubra*, Lin. and *T. astax* Gm. Numerous other examples could be given from the families *Psittacidae*, *Falconidae*, *Muscipidae*, *Tyrannidae*, &c. tending to shew the exclusiveness of the ornithology of South America. Again, when we turn our attention to North America,<sup>18</sup> we find it characterized by certain tribes, which however are not so numerous as those of the other Continent, but quite sufficient in number to mark it out as provincially distinct from South America. But it is not only by the mammalogical and ornithological kingdoms that these Continents are so pre-eminently distinguished from each other. In every department of animated nature we find similar characters, to notice any of which is foreign to our subject at present. But although we have divided the Continents of America into but two provinces, yet we believe the time is not far distant when the mammology, ornithology, entomology, &c. shall be better examined, and more attention paid to the individual members of each class; we shall then instead of two have many zoological provinces. For as in the botanical so in the zoological kingdom, we shall no doubt find series of birds, quadrupeds, &c. having as their fixed places of abode certain regions of the world, beyond which, although a few may migrate, yet upon a careful examination, the greater number will be found to be confined. This statement is well borne out by the collections which frequently reach this country.

Thus what ornithologist who has paid any attention to the subject of the geographic distribution of birds, could not at once distinguish a collection from Southern, from one from Western Africa; or a collec-

15 Man. Ornith. vol. ii. p. 80. Hist. Nat. des Ois. Mouches, p. 69.

16 Zool. Journ.

17 In Mexico a good many species occur.

18 Richardson Loc. Cit. Faun. Bor. Amer. &c.



tion from Northern India, from one from Southern India; or a collection from the Malayan Peninsula from one from any other part of Asia. The same holds true in regard to collections from different parts of the American Continents. Moreover, in the Continent of Australasia we have an ornithology in the neighbourhood of Port Jackson quite different from that we find at Moreton Bay. Thus the *Alectura lathamii*, Gray,<sup>19</sup> found at the latter, is not found in the neighbourhood of Port Jackson, its place being there supplied by the *Menura lyra* Sh. or *M. Novæ Hollandiæ* Lath. It has also been shewn by Professor Jameson, that even in some of the larger islands we have a zoology quite different from that we meet with in the adjoining Continents. Thus he states—In the island of Sumatra, which is only a secondary one in point of magnitude in the Archipelago of Notasia, we meet with the Elephant, Rhinoceros, Hippopotamus, &c.; but the species of animals are often different from those in the neighbouring Continents —. Thus the Rhinoceros of Sumatra is different from that of Asia. Madagascar produces many species of snakes, which are found no where else. The inhabitants of Van Diemen's Land are very different from those of New Holland, and the greater number of mammiferous animals and reptiles are specifically different from those met with in the neighbouring Continents.—That many of the islands of the Indian Archipelago have a zoology peculiar to themselves, has been proved by the researches of Raffles, Horsfield, Sonnerat, Leschenault, Reinwardt, Dussumier, Duvaucel, Diard, Belanger, Kuhl, &c., all of whom have increased our knowledge more or less in regard to them. Nor are the islands farther in the south without their own peculiar *Fauna*. Thus we find in New Zealand not only a great many species, but even many genera which are found to exist no where else. It is here that we meet with that most extraordinary bird the *Apteryx Australis*, first described by Shaw, but whose existence has more than once been called in question,<sup>20</sup> although erroneously, as has been pointed out by Yarrel.<sup>21</sup>

In New Guinea we also meet with a particular *Fauna*. It is here that we find the splendid group of Paradise Birds. We have

19 Proc. Zool. Soc.

20 Lesson Tracte d' Ornith. p. 12. et Man. d' Ornith. vol. ii. p. 210.

21 Tran. Zool. Soc. vol. i. and Zool. Proceed. pt. i. pp. 24, 80. Of this bird there are now several specimens in Europe. In the collection of the Zoological Society of London we saw one specimen, in the Liverpool collection there is an imperfect specimen, and we believe that there is a very fine specimen in the collection of the Earl of Derby, from which Yarrel drew up his description and made his drawing. See Trans. Zool. Soc. vol. i.

therefore in our tables more for convenience, or rather till we get more information on the subject, arranged the birds under the heads of the different Continents, and including all the islands south of Java and Sumatra in the Continent of New Holland, adopting the term of Australasia.

Let us now enter more in detail, and trace out some of Mr. Swainson's so-called zoological provinces. We shall first notice his European or Caucasian Province.

In tracing out the geographic distribution of this province, Mr. Swainson has divided the birds into a series of groups, or orders, thus *Rapaces*, *Grallatores*, *Natatores*, *Gallinaceæ*, *Scansores*, &c., which we shall now notice individually. In regard to the first of these groups, he makes the following statement—"The rapacious order, next to the aquatic tribe, is of all others inhabiting the land the most widely spread. This is particularly the case among the nocturnal species. It is remarkable that of thirteen different Owls inhabiting Europe, six only are peculiar; and two of these more particularly inhabit the arctic regions. Of the rest, four occur in America, two in Southern Africa, and one both in Asia and America. The *Falconidæ*, or diurnal birds of prey, in regard to their species, have a more restricted distribution than the nocturnal; yet of these, the Eagles enjoy no inconsiderable range; of four discovered in Europe (I here use his own words<sup>22</sup>) one is more properly arctic, three have been found in several parts of Africa, and one occurs in America—leaving three only to Europe. It is singular, he continues, that those rapacious birds which, from the peculiar structure of their wings, have been supposed to enjoy the greatest powers of flight among their congeners, should nevertheless have a much more limited range. This is proved by the fact, that of eight genuine Falcons inhabiting Europe and Northern Africa, two only have been discovered in America. It has, however, recently been stated that the Peregrine Falcon of Australia is absolutely the same as that of Europe.<sup>23</sup> Upon the whole, the distribution of the forty-four European birds of prey appears to be thus regulated—three are more properly arctic; eleven are found also in America, two in Asia and Africa, and one in Asia and America; leaving *twenty-seven*, or more than one half, as

<sup>22</sup> Geography and Classification of Animals, p. 22. See also Murray's Encyclop. of Geography, vol. i.

<sup>23</sup> In regard to the identity of the Peregrine Falcon of Europe and Australia there can be no dispute. We examined minutely the specimen described by Horsfield and Vigors in the Linnæan Trans. now deposited in the Museum of that Society, but could not discover one trivial character of difference. For permission to examine it, and the collection generally, we were indebted to Prof. Don.

characteristic of European Ornithology." How Mr. Swainson could have come to such conclusions, seems to us very remarkable ; not one of the statements which he has made, being at all correct. Thus of the thirty-five species of diurnal rapacious birds found in Europe and comprehended in the genera *Vultur*, *Neophron*, *Gypaetos*, *Falco*, *Aquila*, *Haliastur*, *Pandion*, *Circæus*, *Astur Accipiter*, *Milvus*, *Nauclerus*, *Elanus*, *Pernis*, *Buteo*, *Butaetes*, and *Circus*, four are common to Europe and Asia ; three common to Europe and Africa ; three common to Europe and North America ; ten common to Europe, Asia, and Africa ; four common to Europe, Asia, and North America ; one common to Europe, Africa (?) and North America ; one common to Europe, Asia, and Australasia ; one common to Europe, North and South America ; one common to Europe, Asia, Africa, North and South America ; and three (?) cosmopolite, or found in all the different Continents of the world ; leaving only four species proper to Europe, or in the proportion of 1 to 8 $\frac{3}{4}$ , and it is even doubtful at present whether all the four species are confined to Europe. But Mr. Swainson has marked out in a particularly prominent manner the genera of Falcons and Eagles, properly so called, in order to shew that the distribution of birds is not in an equal ratio with their powers of flight—a statement no doubt quite correct ; but he has been very unfortunate in his illustrations, for among all the tribes of European birds, the Falcons and Eagles possess a most extensive distribution. Thus of the nine species of Falcons (one or two of which seem to be only occasional European visitants), two alone are proper to Europe ; three common to Europe and Asia ; one common to Europe and Africa ; one common to Europe and North America ; one common to Europe, Asia, and North America ; and one common to Europe, Asia, Africa, Australasia, North and South America.<sup>21</sup>

That the maxim, as the powers of flight so is the distribution, is not correct, many instances could be given ; and in no tribe have we a stronger evidence to the contrary than in the *Rallidæ*, seeing that they exist in the western hemisphere, so far north as Hudson's Bay, and in the eastern, as far south as the Sandwich islands, having thus a range of about 105° of latitude, and nearly 280° of longitude ; and it is well known that the powers of flight in this

24 Ch. Luc. Bonaparte, in his Catalogue of American and European Birds, gives a new name to the Osprey of America ; upon what grounds we know not. Gould in his work on the Birds of New Holland, now publishing, has described the Osprey of that quarter as a new species, to do which he is not at all entitled, there being no characters whatever presented to mark them as specifically distinct. In the Ed. Museum there is one specimen from New Holland, agreeing in every character with specimens, killed in Europe. The same remarks apply to the American species.



tribe is not at all well developed, at least to such a degree as to account for its extensive distribution. Nor does this remark apply to this group alone, many other examples, if it were necessary, could be given. In regard to the Eagles, Mr. Swainson's statements are equally inaccurate. Thus of the nine Eagles included in the genera *Aquila*, *Haliæetus*, *Pandion*, and *Circaetus*, two are common to Europe, Asia, and Africa; one common to Europe and North America; one common to Europe and Asia; one common to Europe and Africa; two common to Europe, Africa, and North America; one cosmopolite; leaving only one proper to Europe; for it seems not at all improbable, that the *Aquila imperialis* will be found extending throughout the African Continent.<sup>25</sup> Moreover it may be stated as a general rule, that in whatever families we observe a large series of modifications, there we have a wide distribution. This is strikingly the case in the *Falconidæ*, *Anatidæ*, *Sylviadæ*, *Muscicapidæ*, *Columbidæ*, *Fringillidæ*, *Laridæ*, *Turdidæ*, *Laniadæ*, &c. Nor is this rule confined to the ornithological kingdom; we have a similar arrangement exhibited in the mammalogical, as well as in many of the other kingdoms of the organic world; and when we direct our attention to the inorganic, we can trace out a similar arrangement. Thus in those families in the mineral kingdom in which the physical and external characters are very various, in them we find a most extensive distribution, as is well exemplified by the quartz, calcareous spar, and garnet families, modifications of which occur in every formation, from the oldest up to the newest; in every climate, from the inhospitable regions of Melville island to the tropics, and in all the intermediate spaces; and, on the other hand, from the tropics as far south as 70°, and also at all heights and depths yet attained by man, viz. from 20,000 feet above, to 1600 feet below, the level of the sea.<sup>26</sup>

In regard to the nocturnal birds of prey, comprehended in the genera *Strix*, *Bubo*, *Otus*, *Scops*, *Surnia*, *Ulula*, *Syrnium*, and *Noctua*, we have the following statement to make, which is quite at variance with that given by Swainson. Thus of the fifteen Owls found in Europe, three only are proper to it, one of these doubtful; common to

25 Mr. Gray, in General Hardwicke's Work on Indian Zoology has figured a bird under this name, which however is quite a different species. The specimens noticed in the Asiatic Society's Journal for November, 1838, as varieties of the *Aquila chrysaetos* by Dr. Evans, are quite different birds; in fact they do not belong to the genus *Aquila* at all, being characteristic specimens of the genus *Haliæetus*. The bird is a new species, and the only other specimen we have seen is in the collection of the Zoological Society, London.

26 Jameson's manuscript Lectures on Miner. see also Man. and Syst. of Mineralogy.

Europe and Asia, two ; to Europe, Asia, and Africa, two ; to Europe and North America, five ; to Europe, Asia, North and South America, one ; to Europe, Asia, Africa, and North America, one ; to Europe, Australasia, and North America, one ; thus leaving a proportion of 1 to 5 ; and from these statements it appears evident that the nocturnal birds of prey do not possess such a wide distribution as the diurnal, as stated by Swainson.

But Mr. Swainson in summing up his observations gives, as already stated, 27 species as peculiar to the European or Caucasian province—a number four times larger than we from a most careful and extensive examination have made it ; the number being only seven, and it is even doubtful whether all these are peculiar to this so called zoological region or province.

Having now finished our analysis of the distribution of the Rapacious order, we shall now proceed to another of Mr. Swainson's divisions, viz. the *Gallinaceæ*, whose distribution we shall follow out in a similar manner. "On looking,"<sup>27</sup> says he, "to the whole number of our *Gallinaceæ*, we find twenty seven species, fourteen of which have their metropolis in Europe ; the remainder are thus dispersed—five extend to Western Asia ; five to the confines of the great African Desert ; two are dispersed over Central Asia and Africa ; whilst two occur in North America." In the above statements Mr. Swainson differs very considerably from our examination ; at least it is difficult to understand what he has included in his *Gallinaceæ*, for to make up the number of species we must include the genera *Columba*, *Tetrao*, *Bonasia*, *Lagopus*, *Pterocles*, *Francolinus*, *Perdix*, *Coturnix*, *Hemipodius*, *Otis*, *Cursorius*, and *Glareola*, comprehended under which we have twenty-seven species ; of course leaving out the *Tetrao rupestris*, a doubtful species, and which has only been met with in Europe once or twice. Nor do we include the *Phasianus colchicus*, an imported species. We however comprehend the *Tetrao hybridus*,<sup>28</sup> considered erroneously by some naturalists as a hybrid between the *Tetrao urogallus* and the *Tetrao tetrix*, it presenting many characters to mark it out as a distinct and well marked species. Of the twenty seven species found in Europe, five are common to Europe and Asia ; three common to Europe and North America ; one or two (?) common to Europe and Africa ; and four common to Europe, Asia and Africa ; thus leaving fourteen proper to Europe, or in the proportion of nearly 1 to 1 ; and of these, one alone is peculiar to the British islands, which is

<sup>27</sup> Loco. Citato. p. 23.

<sup>28</sup> Yarrel, Proc. Zool. Soc. Gould's Birds of Europe.

rather curious, it being the only bird which is so. Moreover the manner in which Mr. Swainson has traced the distribution of this tribe is much to be questioned, it appearing to us a more plausible than real one, many of his statements no doubt being founded on the peculiarity of the country; at least we are not at all aware of any thing being stated by any author which would authorize him to make such statements, and he makes no mention of being guided by personal examinations, which he no doubt would have done had he travelled in these regions, seeing that there is no individual more ready to inform us of the extent of his travels.

In regard to his next division, we have the following statement—<sup>29</sup> “The Swallow-like birds, *Fissirostres*,” says he, “are well known by capturing their food on the wing, and by their migratory habits; only one, the common or European Kingfisher, being stationary. Hence it is, that most of the European species occur in other regions; the proportion of those which appear confined to Northern Africa is as 1 to 3.” He does not give any more details in regard to the *Fissirostres*, leaving his readers to fill up the rest by their own imagination. In his proportional number of species he is not correct. Thus of the fourteen included in the genera *Hirundo*, *Caprimulgus*, *Merops*, *Coracias*, *Alcedo*, three are probably confined to Europe; and of the others, three are proper to Europe and Asia; to Europe and Africa, three; to Europe, Asia, and Africa, three; to Europe, Africa, and North America, one; and to Europe, Asia, Africa, and North America (?) one; thus leaving a proportion of 1 to  $3\frac{4}{6}$ ; but as many of the species, as stated by Mr. Swainson, of this order are migratory, it renders the proportional number very doubtful; at least it is very liable to vary.

In regard to the *Scansores*, Mr. Swainson states their number to be fifteen, including probably the genera *Picus*, *Apternus*, *Yunx*, *Sitta*, *Certhia*, *Tichodroma*, *Upupa*, and *Cuculus*, eight of which he states are confined to Europe; and as for the distribution of the other seven, as in the *Fissirostres*, he gives us no information. The number of species however is eighteen, and of these eleven are proper to Europe; two common to Europe and North America; three common to Europe and Asia; one common to Europe, Asia, and Africa; and one, the Wryneck (*Yunx torquilla*) common to Europe, Asia, and North America, which was many years ago pointed out.<sup>30</sup> Whether all of the above ten species are proper to Europe, is at present a question, owing

<sup>29</sup> Loc. Cit. p. 24.

<sup>30</sup> Jam. Edin. New Phil. Jour. and James Wilson's Quart. Rev.

to the near approximation of several species from Northern India, which still require further examination ; and before the point can be settled, a large series of specimens will require to be examined. In the Indian Creeper (*Certhia vitticauda*, Jam.)<sup>31</sup> and Indian Nuthatch, (*Sitta Himalaehensis*)<sup>32</sup> although we have many characters in common with the European, yet still there are many others entitling us to consider them as specifically distinct. The occurrence of the former species in Northern India was a most interesting discovery, pointing out that the genus *Certhia* is more widely distributed than was originally imagined. In several of the Woodpeckers of Northern and Southern India we have also a great similarity with the European species, and in fact so remarkable, as to cause several of the more recent writers to consider them as identical.

In noticing the Crow and Starling families (*Corvidæ* and *Sturnidæ*) Mr. Swainson has made some most extraordinary statements. Thus he states that not only several species, but even peculiar genera are left to characterise this portion of the world. To us this is quite unintelligible. Species we have, we will admit, but as for genera in this group peculiar to Europe, there are none ; and even among the whole birds of this so called province, there is not one genus peculiar to it, if we except one or two among the *Sylviadæ*, whose generic characters however must be called in question ; and even if they should latterly be found to be correct, it would give but little more weight to Mr. Swainson ; for there is no group hitherto more neglected, and of which our knowledge is so imperfect, than the *Sylviadæ*.

For many years, no doubt, the genera *Cinclus*<sup>33</sup> and *Nucifraga* were supposed to be confined to Europe ; but species belonging to the former have been found in North America and Northern India ; and in regard to the latter, we have one species occurring in Northern India, considered erroneously by some authors as identical with the European—it is the *Nucifraga hemispila* of Vigors. We shall after-

31 This bird has received other two names. It has been described by Vigors as the *Certhia Himalayana*, Proc. Zool. Soc. Pt. i. p. 174, and by Swainson as the *Certhia Asiatica*, Anim. Menag. p. 353.

32 Jard. and Selb. Zool. Illust.

33 The distribution of the Dippers stands thus—In Europe we have two species, one proper, the other being also found in Northern India. In America N. and S. (?) one species (*Cinclus Americanus*). The new species described by Bonaparte is the above. Audubon, since the above was written, informed us that he had received two new *Cincli* and a true *Nucifraga* from the Rocky mountains, the latter however had been long before described as a *Corvus*. Brehm has described a third species under the name of *Cinclus melanogaster*, it however appears to me to be a mere variety of the *Cinclus aquaticus*.



wards notice the European genera in regard to their distribution, but in the mean time shall confine our attention to the distribution of the species. In regard to the species included in the genera *Corvus*, *Sturnus*, &c. Mr. Swainson states their number at twenty-one found in Europe, thirteen of which, or more than one half, habitually reside; four occur in Northern and Central Africa; one common to Europe, Asia, and Africa; and three found in America. Nor are the above statements even in regard to the species correct. Thus of the seventeen species, for we cannot make out more, included in the genera *Corvus fregilus*, *Pyrrhocorax garrulus*, *Nucifraga*, *Pastor*, and *Sturnus*, six are proper to Europe; four common to Europe and Asia; one common to Europe and Africa; three common to Europe, Asia, and Africa; two common to Europe, Asia, and North America; and one common to Europe, Asia, Australasia (?) and North America. We mark Australasia with an interrogation, for the occurrence of the *Corvus corone* in that Continent seems doubtful. It is upon the authority of M. Lesson,<sup>34</sup> that we make the statement; who, however, we rather think has confounded with it a nearly allied, but quite distinct species. M. Temminck<sup>35</sup> has also in his Catalogue of the Birds of Japan given the *Garrulus glandarius*, and marks it as the Japanese variety, which it undoubtedly ought only to be considered, for the characters which it presents vary so little from those of the European, and are of such a trivial nature. It is not to be confounded with the *Garrulus bispecularis* of Vigors,<sup>36</sup> a well-marked species, also presenting a close affinity to the European, it however is confined to Northern India. In the *Garrulus melanocephalus*, Bon.<sup>37</sup> we have another species presented, bearing a close affinity to the European, but it not only differs in several characters, but also, like the two Indian species, has a quite different distribution, representing in its locality the common *Garrulus glandarius*.<sup>38</sup>

34 Ann. de Sci. Nat.

35 Man. d' Ornith. vol. iii. Introd.

36 Proceed. Zool. Soc. Pt. i. p. 7. Gould's Cent.

37 Gen. Mem. of the Acad. of Turin, vol. xxxvii. p. 298.

38 Strickland on the Birds of Asia Minor. Proc. of Zool. Pt. iv. p. 97.

( To be Continued. )

ART. IV.—On a new Genus of the Fissirostral Tribe. By B. H. HODGSON, Esq. Catamandu.

[Note by the Editors.—This and the following paper were transmitted to the late Editor more than two and a half years back, and were acknowledged at the time, though by some accident afterwards mislaid. The expert ornithologist will perceive that Mr. H's. genus *Raya* is equivalent to the *Psarisoma* of Swainson, and the *Crossodera* of Gould; but, by referring to dates, it will be seen that Mr. H. was the first person to characterise this new form, of which he has given two species.]

*Dentirostres todidæ*, Swainson.—*Fissirostres todidæ*, Vigors.—*Syndactyles*, Cuvier.

Genus—new, *Ráya nobis*. Species two, new, *Sericeogula* and *Rubropygia*. *Rai* and *Rai Súga* of the Nipalese. *Habitat*, Central and lower regions.

These singular birds might be considered with almost equal propriety as the Dentirostral type of the *Fissirostres*, or the Fissirostral type of the *Dentirostres*.

Swainson would regard them in the latter light; Vigors in the former; Cuvier would probably have placed them with hesitation among his *Syndactyles*. They seem to me to be compounded of *Tityra* and *Eurylaimus*—two parts of the latter, and one of the former.

The bill is shorter, broader, more arched along the culmen, less suddenly hooked, as well as more deeply cleft in the head than in *Tityra*; it is longer, and more covered by those frontal plumes which entirely conceal the nares, than in *Eurylaimus*. The nostrils have exactly the same character as in *Tityra*, but they are considerably more advanced, being nearer to the tip than to the gape. The wings agree in their gradation with those of *Tityra*, but they are shorter and feebler than in that genus, or in *Eurylaimus*; and in consonance probably with this feebler structure of the wing is the elongation and extreme gradation of the tail of our birds, a feature in which they differ alike from *Tityra* and from *Eurylaimus*.

The feet of the *Rayæ*, like their bills, more nearly resemble those of *Eurylaimus* than those of *Tityra*; and whilst they differ from both genera by the smoothness of the acrotarsia, they depart from their otherwise strict correspondences with the feet of the former genus by the essential circumstance of a more restricted junction between the toes. In *Eurylaimus* the exterior toe is united to the end of the second phalanx, the interior, to the end of the first. This, the typical syndactyle structure, is only half developed in *Ráya*; the connexion between whose lateral fore toes reaches forward only to the middle of the respective joints.

With these preliminary remarks we shall proceed to characterise the genus or sub-genus *Raya*, thus—

Bill shaped as in *Eurylaimus*, but equal to the head, or longer, and having the soft frontal zone more produced, and concealing the nares; orbits nude; head large and crested; gape very wide and smooth; wings scarcely exceeding the base of the tail, rather feeble; the third and fourth quills longest and equal; the first and second, very slightly gradated; the primaries plus the tertiaries by about half an inch.

Tarsi longer than central digit, slender, smooth, more or less plumose; toes and nails as in *Eurylaimus* exactly, but the connexion of the lateral fore toes reaching only to the centre of the second and first phalanges respectively; tail elongated, firm, conspicuously and equally gradated throughout; tongue short, flat, triangular, sub-fleshy; the tip pointed, cartilaginous, and sub-bifid or sub-jagged. In manners, and food assimilating with *Trogon*, and with *Rucia (nobis)*.

1st. Species. *Sericeogula*. Silken-throated *Ray*, *nobis*. Parrot-green, changing into verditer blue below; head and neck, superiorly, black; inferiorly, silken yellow; a narrow band of the latter colour circling round the brows, and bottom of the neck, so as to enclose the black colour; a blue spot on the crown, and top of the back, and a yellow one behind each ear; tail, and external edge of the primaries blue; wings and tail, internally, jet black; orbital skin yellow; iris hoary brown; bill lively green; legs dull greenish or yellowish; crest vague; tail considerably elongated, and wedged; the gradation equal, and complete; tarsi plumed at top only; 11 inches long by 13 wide, and  $2\frac{1}{2}$  oz in weight; bill  $1\frac{1}{8}$  inch; tail  $5\frac{1}{2}$ ; tarsus  $1\frac{1}{4}$ ; central toe  $\frac{13}{16}$ , and nail  $\frac{5}{16}$ ; hind toe,  $\frac{8}{16}$ , and nail  $\frac{6}{16}$ . Sexes alike.

2nd. Species. *Rubropygia*. Red-rumped *Raya*, *nobis*. Structure less typical; colour slatey grey blue; lower part of the back, tertiaries, and upper tail coverts, red; wings, tail, tibiae, and a band from the eyes to the nape, black; primaries with a blue speculum, and blue tips; the latter margined on the inner side with white; rectrices, except the two central ones, broadly tipped with white; head conspicuously crested; tail shorter, and rather rounded than wedged; tarsi half plumed; bill soft blue; iris brown; orbital skin, orange; feet greenish; size 7 to  $7\frac{1}{2}$  inches by  $10\frac{1}{2}$  to 11, and  $1\frac{1}{4}$  to  $1\frac{1}{2}$  oz; bill  $1\frac{1}{16}$  inch; tail  $3\frac{1}{4}$ ; tarsus  $\frac{15}{16}$ ; central toe  $\frac{11}{16}$ ; hind toe  $\frac{6}{16}$ . Sexes alike.

Nepal, May, 1836.



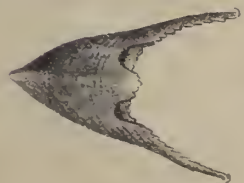
The genus *Sibia nobis*



outside view



inside views



The genus *Raya nob.*



ART. V.—Description of two new Species of a new form of Meruline Birds. By B. H. HODGSON, Esq. Catamandu.

*Merulidæ philedones*, Cuvier.—*Merulidæ crateropodinae*? Swainson.—*Tenuirostres meliphagidæ*, Vigors.

Genus—new, *Sibia nobis*. *Sibya* of the Nipalese. *Habitat*. Lower and central regions of the hills.

What shall we say to a Meruline form compounded of the bill and tongue of *Chloropsis*, the nares of *Cinnyris*, and the wings, tail, and feet of *Cinclosoma*? for such is the general, though not the precisely accurate, indication of the form I am about to describe.

Cuvier has separated from the promiscuous heap of the Meruline Birds a group which he tells us is distinguished from the *Merles* by a slenderer, sharper, and more arched bill, and by a brushed tongue. To this Cuvierian group my birds unquestionably belong; but the group itself is so large, and its contents have been so little accurately ascertained, that small way is made to a definite conclusion by the determination of that point. There are a vast number of the aberrant Thrushes, both short legged and long, which closely approximate by the bill and tongue towards the *Tenuirostres*; but I am nevertheless of opinion that these relations are of secondary, not primary, importance. The birds in question are Thrushes, as Cuvier considered them to be; but whether or not they can be, most of them, ranged with propriety among the *Brachypodinae* and *Crateropodinae* of Swainson, I know too little of his general system to enable me to judge.

It may serve to illustrate the character of our birds to say, that they appear to me to belong to the latter sub-family, serving in many respects to link together the two. Mr. Swainson considers the long-legged Thrushes to be equivalent to the *Tenuirostral Promeropidae*. It is certainly remarkable that in one of our species we have the long, broad, and gradated tail of *Promerops*.

— Genus—SIBIA NOBIS.

*Generic character*.—Bill and tongue as in *Chloropsis*; but the bill more depressed and more keeled towards the base; and the tongue forked as well as brushed. Nares basal, lateral, elongated, pervious, lunated, and almost lineated by a large, soft, sub-arched and nude membrane.

Nareal bristles, none; rectal, small; frontal plumes smooth; wings, medial, round, acuminate, firm; fifth and sixth quills longest; first and second considerably, third and four trivially, gradated; primaries plus tertiaries nearly one inch; tarsi elevate, stout, nearly smooth; toes submedial, simple, stout; fores compressed, hind depressed and large;

lateral fores and hind subequal, last strongest ; nails stout, moderately curved, acute ; tail various, as in *Promerops* or in *Cinclosoma*.

Species 1st. *Picavides*. Pie-like *Sibia mihi*. Saturate slatey-blue ; paler and greyer below ; darker and merging into black on the wings and tail ; speculum on the secondaries, and tips of the rectrices, white ; legs plumbeous ; bill black ; iris sanguine ; tail very long, and gradated conspicuously and equally throughout ; head not crested ; 14 inches long and as many wide ; bill  $1\frac{1}{8}$  inch ; tarsus  $1\frac{1}{4}$  ; central toe  $\frac{3}{4}$  ; hind toe  $\frac{9}{16}$  ; its nail  $\frac{7}{16}$  ; tail  $8\frac{1}{2}$  ; weight  $1\frac{1}{2}$  to  $1\frac{3}{4}$  oz. Sexes alike.

Species 2nd. *Nigriceps*. Black-capt *Sibia mihi*. Rusty, with the entire cap and the wings and tail, internally, black ; central wing coverts white toward their bases, slatey toward their tips ; outer webs of the primaries slatey-grey ; of the secondaries and tertiaries, slatey ; the last, rusty, like the body ; two central rectrices con-colourous with the body towards it, then black ; the rest wholly black, and all with broad slatey points ; bastard wing black ; legs fleshy brown ; bill black ; iris brown ; tail moderately elongated, gradated only in the six laterals ; head with a full soft garruline crest ; outer web of the secondaries rather enlarged, discomposed, and curled downwards ; size  $8\frac{1}{2}$  to 9 inches, by  $10\frac{1}{2}$  to 11, and  $1\frac{1}{2}$  oz. in weight ; bill 1 inch ; tarsus  $1\frac{5}{16}$  ; central toe  $\frac{10}{16}$ , and nail  $\frac{4}{16}$  ; hind toe  $\frac{7}{16}$ , and nail  $\frac{6}{16}$  ; tail  $4\frac{1}{4}$ . Sexes alike.

3rd. Species. *Nipalensis, nobis*. Described already as a *Cinclosoma*,<sup>1</sup> and forming a singular link of connexion between the *Cinclosomæ* and the *Sibiæ*. I postpone what I have to say upon the habits and manners of these birds to a future opportunity ; at present it must suffice to observe, that they are indissolubly linked to the *Merulidæ* by the nature of their food and manner of taking it.

Nepaul May, 1836.

ART. VI.—On the Egyptian system of Artificial Hatching. By  
DON SINBALDO DEMAS.

Several unfruitful attempts have been made in different parts of Europe since the labours of Reaumur to introduce the artificial mode of hatching eggs. In some parts chickens have been brought forth which have not propagated ; in others, for instance in Aranjuez, instead of chickens, hard eggs have been made. Notwithstanding these failures, being persuaded that they proceeded rather from ignorance on the part of the experimentalist than from any real or insuper-

<sup>1</sup> Note.—As Soc. Transac. Phy. Class., vol. xix. p. 143.

able obstacle in the nature of the country where the experiments were performed, since my arrival in Egypt I determined to study in person minutely all the proceedings, without trusting to accounts which would always leave me uncertain of the truth. The enterprize was by no means an easy one. Few in Egypt possess the art, and those few make a secret of it. Besides, this first difficulty vanquished, so much patience and perseverance is necessary to remain for 21 days in an oven at  $34^{\circ}$  of Reaumur, full of the pestiferous smoke of burning dung—contending incessantly with the stupidity and prejudices of the Arabs, who always suspect some sinister motive, and to every thing oppose difficulties, (believing, among a thousand other follies, that the thermometer warms the room in which it is introduced,)—that no traveller before me, that I am aware of, has examined the matter in a satisfactory manner, or has given a circumstantial description of it. Nevertheless, my intimacy with my countryman Gaityany Bey, who rendered me every facility which the Government could offer, my knowledge of the vulgar Arabic language, and my constitution of the south of Europe, enabled me to overcome all the obstacles which hitherto embarrassed all Europeans who attempted to investigate this subject.

Before entering on a description of the process, I will stop a moment to shew that the artificial hatching, practised from time immemorial in Egypt, is not only a curious fact, but an eminently useful one; since it facilitates with surprising rapidity the reproduction and abundance of the fowl, as well as the egg; both of which may be reckoned among the most pleasing and salutary articles of food for man.

The operation is carried on in an oven, generally composed of eight divisions or cells. In each of them 6000 eggs are hatched every 21 days, for the space of  $3\frac{1}{2}$  or 4 months. It is admitted that Egypt contains more than 200 of these ovens. Deducting one quarter of the eggs which may be lost, we shall see that this artificial hatching gives  $37\frac{1}{2}$  millions of chickens in one third of the year; which again must produce an immense number of eggs.<sup>1</sup> Thus it happens that although latterly the price of all provisions has been doubled in that country, I have bought in Upper Egypt one egg for half a *para*, and the best fowl for a *piatra*.<sup>2</sup> It is to be considered also, that the power of establishing these ovens is given by Government to the highest bidder; and that from this circumstance a considerable revenue is received, which cannot fail to raise the price of the article.

1 In the *Encyclopædia Britannica* the number of ovens is stated to be 360; and the chickens produced 92 millions; which I think at least in the present day is a very exaggerated calculation.

2 One Company's rupee=10 piastras. 1 piastra=40 paras.



To produce  $27\frac{1}{2}$  millions of chickens without artificial heat, at least two millions of productive hens would be required in the space of four months!

The artificial mode of hatching does not oppose any obstacle to the natural one, since a hen born by means of the oven, or under the wings of the mother, at every season of the year can as well in Egypt as in any other country cover and hatch its own eggs.

One great inconvenience has been attributed to this method—it is said that the fowl degenerates, and consequently its egg.

This opinion originated in observing that the fowl of Egypt is generally smaller than that of Europe. The fact is true; but I can by no means agree that it is the consequence of artificial hatching. It is to be considered, 1st, That in Egypt several animals are of smaller size than those of other countries. 2d, That the artificial hatching consisting only in applying to the egg the same degree of heat that it might receive under the hen, without changing any of the natural operations, the number of days which it employs in vivifying it, &c. there is no plausible reason to suppose that the chicken does not under this process attain its natural size. 3d, That there is in some parts of Upper Egypt a large kind of fowl called *bigany* or *dinderany*, and its eggs placed in the oven produce fowls equal in size to the mother. 4th, and to me the most convincing argument of all—if the action of fire could so reduce the fruit of the egg during its development, other circumstances being the same, the same cause must continue to operate every year, and small as this annual diminution may be considered in the number of ages that this method has been practised, (we find artificial egg hatching mentioned by Herodotus,) the fowl of Egypt ought to be reduced by this time to the size of a fly at least. Lastly, even admitting the hypothesis of degeneration, we must admit that the decrement has operated in a very slow and imperceptible manner. This diminution being so inconsiderable, can by no means neutralize the beneficial results of artificial hatching.

The economy and benefit that this method is capable of diffusing among those who practise it being sufficiently demonstrated, I will proceed to give a circumstantial narrative of all the steps of the operation, as I have seen it practised in the ovens established in Ghisa, a suburb of Cairo, situated upon the right shore of the Nile.

The building is composed of a corridor with vaulted roof 40 feet long and 5 broad (A B C D, fig. 1st) The vaulted roof has five small apertures to give light. In the centre, to the right hand, there is a door of  $3\frac{1}{2}$  feet high and  $2\frac{1}{2}$  broad (E, fig. 1st); this leads to another corridor (F G H I, fig. 1st) 48 feet long by 5 broad, also with vaulted

roof, in the centre of which there are three apertures (J K L, fig. 2nd) of nine inches in diameter, to give light from above; to the right and left hand of the corridor there are five divisions or cells of two stoves. Each inferior room or stove has an aperture of  $1\frac{1}{2}$  feet square (M, fig. 2nd). The superior room has another aperture above of two feet five inches in height, and one foot nine inches broad (N, fig. 3rd); it has also an aperture of one foot square in the wall of the right hand, and another of equal size in the left, which I have seen constantly stopped up with tow (d, fig. 4th). The walls of the said upper stove begin rectangular from the ground, finish in a vault of  $6\frac{1}{2}$  feet high (O, figs. 3rd and 4th), with a hole in the top of nine inches diameter (P, figs. 3rd and 4th). The ground of this room is nine feet long and eight broad (X Z V U, fig. 5th) and has in its breadth, that is to say in the same direction with the corridor, two grooves (Q Q, R R, fig. 5th.) of nine inches broad and two deep, and in the centre an aperture almost round of two feet in diameter (S, fig. 5th). The first room entering to the right hand is destined to keep a fire always kindled; it has only one stove, and its door is larger than the others (T, fig. 2nd). The first room to the left hand has no hole in the ground of the upper stove, but only a fissure of two feet, which separates the ground from the interior of the wall, to which it is notwithstanding united by several iron bars in the form of an oblique grate, (b, fig. 6th.) In this cell the materials destined for combustion are thrown through the hole in the top. They pass through the grate as through a sieve, and are taken away by the inferior aperture to be transported to the opposite cell which contains the magazine of fire.

There are, lastly, to the left hand of the exterior corridor two rooms 15 feet square, with vaulted roofs of 12 feet high, with an aperture in the top; they are intended for the preparation of eggs, as well as a place for chickens recently born, &c. (f and g, fig. 1st).

The material for constructing the oven, is the same employed generally in Egypt for the houses of the peasants; that is to say, mud mixed with straw. The vaults are constructed with burnt bricks. The ground which divides the cell in two stoves is sustained upon two trunks of palm trees parallel to the corridor, and a bed of branches of the same tree supported by the said trunks. Upon this entablature is spread the mud which forms the ground whereon the fire is placed.

A little straw or tow is prepared on the ground of the inferior room; upon it a mat is placed, and upon the mat 6000 eggs,



which are not more than twenty-one days old, taken from a hen-yard in which there is a cock.

For combustibles the dry dung of animals is used, which the Arabs reduce to small pieces with their hands; this material they call *دِيمَس* (*dims*). In the first room to the right hand two pyramids of burning *dims* are formed, covered with common earth. The *dims* must take fire slowly, without making a flame. It is taken up with a fire shovel, put on to a plate of baked earth, and afterwards placed in the grooves (Q Q, R R, fig. 5th) which have been first half-filled with cold *dims*. Again a little *dims* is placed upon the burning portion, and upon the whole a little earth is strewed. The burning *dims* which is taken from the magazine is continually replaced with an equal quantity of cold material.

On the morning of the day destined to begin the operation the fire is placed in the cell to warm it, and at sunset the 6000 eggs are disposed in the manner explained. The fire is renewed three times a day—at dawn, at midday, and at sunset; there is however no very religious exactitude observed in this. If the fire put on in the evening is yet alive at the dawn of the subsequent day, it is left, and is not renewed till midday. In one instance, which I saw, being ready about 12 o'clock to put on the fresh fire, a quarrel happened, and it was not put on till 3 o'clock. At sunset it was not renewed, and this *dims* lasted till the dawn of the subsequent day.

When the new fire is put on, the door of the superior stove is left open, also the hole of the vault, and if the fire is too strong, even the small door of the inferior stove. The aperture in the ground of the superior stove is always covered, as well as the two apertures in the walls to the right and left hand. When the heat begins to mitigate and the smoke to disappear, all the small doors of the inferior stove are stopped up, afterwards the hole at the top of the vault, and lastly the door of the superior stove, which is not generally stopped. The doors of all these apertures are merely handful of tow for each. When the fire is recent, and the heat at its greatest strength, the thermometer marks 33° or 34° of Reaumur. When the fire is extinct, and before it is renewed, the heat is 30° sometimes as low as 29°.\* Six or

\* Reaumur. Fahrenheit. Centigrade.

24	=	86	=	30
28	=	95	=	35
32	=	104	=	40
36	=	113	=	45

seven times every twenty-four hours the operation that I am going to describe is practised.

A man entirely naked enters by the door (N, fig. 2nd); he either carries a light in his hand or he opens the hole of the vault to procure light; he opens also the round hole in the centre of the ground, and comes down through it to the inferior stove. He carries all the eggs placed on the side V fig. 7th to the side U; and those of the side U to the side V. The eggs placed under the central hole are found sensibly colder than those placed at V and U, and these latter not so warm as those of the sides X and Z. Generally they are heaped toward the corners. This operation is very necessary not only to apply the heat to all the points of the egg, but to apply it in the same proportion to all the eggs, so that development may not be effected sooner in one than in another. This removing of the eggs is performed during the day, and several times during the night. Thus the affair proceeds till the 7th day. On this day, as on the 8th, the whole of the groove before the door R R, fig. 5th, is not filled with fire, but only 2 or  $2\frac{1}{2}$  feet near the entrance. By these means the heat is diminished gradually; and during these two days the thermometer at its greatest height marks only  $32^{\circ}$  or  $31^{\circ}$  of Reaumur. After the 8th day fire is no longer placed in the room. We should naturally expect that the cell unprovided with fire would return to the natural temperature of the surrounding air, but it is not so. We have already said that in the oven there are eight cells destined to the process of hatching. Three or four days after that on which the eggs have been put in the first room, they are placed in the second, and so on successively. The consequence is, that though one or two cells may be without fire, the others contain it; besides which fire is always burning in the chambers wherein the fuel is prepared, the door of which is never stopped, while its temperature ranges from  $36^{\circ}$  to  $38^{\circ}$ . All these fires produce a degree of heat which diffuses itself through the whole building, and maintains even in those rooms which are without fires a temperature varying from  $27^{\circ}$  to  $27\frac{1}{2}^{\circ}$ . On the 14th day another operation is performed. Half the eggs are left in the inferior room (fig. 8th) and the other half are brought to the upper one upon a circular bed of tow (fig. 9th); in this way they continue wrapping them up two or three times a day, but without bringing down those from above, or carrying up those from below. To this operation of dividing the eggs they do not attach much importance. During my observations of the operation, this division was not executed till the 16th day, because they had no tow ready to prepare the circular bed with. When the eggs are divided, the man does not enter again through the

door of the superior stove, but through that of the inferior one, arranging the eggs below ; afterwards standing up he pushes his head and arms through the hole of the roof, and arranges those above.

The eggs which have not been in the oven eight days they call صري (*el tari*) *the fresh*. I have eaten some of them after two or three days baking, and they were good. Towards the sixth or seventh day, they look at them before a light. If the egg appears opaque and obscure, it is inferred that the operation will succeed ; on the contrary, if it is transparent and white, they conclude that the chicken will not be formed. The people who keep the oven eat these eggs or sell them. They have the appearance and taste of boiled eggs. Those which go on without fire after the eighth day they call ملوح (*meláh*) *the good*. Lastly, those which have continued more than twelve days in the cells they call المسكوا (*el mésku*) *which has taken* ; or that wherein the chicken is already formed. The cells where eggs are divided half below and half above, as they are placed after the fourteenth day, have their doors constantly stopped with great care. During the last days of the process the hole of the top of the vault is not only stopped with tow, but with a great deal of earth upon the tow. Four or five days before the end of the operation, the door in the upper stove being open, as well as the hole of the vault, the thermometer indicates  $26^{\circ}$ , the hole being stopped  $27\frac{1}{2}^{\circ}$ , and the door being stopped  $27^{\circ}$ . Two days before the birth of the chicken, being all well stopped, the temperature reached to  $28^{\circ}$ , and the day before to  $28\frac{1}{2}^{\circ}$ . At the moment that the chickens are coming to life the heat is  $28\frac{1}{2}^{\circ}$  ; and in the inferior stove, in which there are about a thousand recently born,  $30^{\circ}$  ; an augmentation which proceeds no doubt from the animal heat of the young birds, since there is no fire in the room, nor has there been any in it for thirteen days.

It is also curious to observe that the temperature varied during the last few days ; this probably is the effect of the animal heat which begins to develope itself in the inside of the eggs.

If we reconsider all the facts I have detailed, we shall see that the hatching of which we are speaking, consists only in applying to the egg equally and regularly during twenty-one complete days, a degree of heat which beginning with  $33^{\circ}$  or  $34^{\circ}$  of Reaumur, falls to  $27\frac{1}{2}^{\circ}$  or  $27^{\circ}$ , and rises again to  $28^{\circ}$  or  $29^{\circ}$  with the help of the animal caloric, produced by nature in the process of hatching.

As soon as the chickens are born, the egg-shells are thrown away. The eggs of the inferior stove are carried to the upper, and the chicken to the inferior, which is reserved for them. These are treated with

very little care. They take them up in handsful and throw them below. Here they remain till the subsequent day, on which they are draw out to the corridor, where they pass some hours ; sometimes one whole day. After this they are carried in covered baskets to particular houses, as will be explained, where they begin to eat ground corn or hard eggs. During the day they are exposed to the sun ; before sunset they are carried to a room to be sheltered from the cold. The Arabs *never* help the chicken in breaking the egg-shell.

During the hatching at which I was present, the natural temperature in the shade varied from  $13^{\circ}$  to  $16^{\circ}$  ; the day on which the chickens were born it was  $16^{\circ}$ , and the thermometer exposed to the sun about midday marked  $29^{\circ}$ . On the subsequent day, under the same circumstances, it rose to  $33\frac{1}{2}^{\circ}$ . The weather was always perfectly fair excepting the fifteenth day, on which a little rain fell during the night. All the apertures were on that occasion well shut up, and the dampness produced no bad effects.

I have always placed the thermometer in the upper stove (n. fig. 3) in which the fire existed. That which served me for these observations compared with others of Reaumur's, was found to be rather lower than these.

The oven in which I studied this description, began its labours on the 2d of February last. Generally they begin fifteen or twenty days later. The hatching season closes in the month of June at the latest.

In the midst of summer the sun is more powerful, and the eggs more abundant and cheap. Why, then should this operation be practised in the spring ?

To give a satisfactory answer to this objection, there must be facts of which I am not possessed, never having had either opportunity or time to set one of the ovens in operation during the hot season. However I am fully convinced in my own mind that spring is the season best calculated for this operation in Egypt, according to the present mode of working ; for the first inventors of these ovens would not have fixed upon this season but through experience, having no doubt made repeated trials.

Where facts are wanting, conjectures founded on observations and reason, may frequently in a great measure supply the deficiency ; I shall therefore state what I conceive to be the reasons for giving spring the preference to summer in the lighting of the ovens.

1. During the spring months a hot southerly wind prevails, which ceases at the commencement of summer, yielding to a strong, cold, northerly one ; this fills the whole atmosphere with dust and fine sand, of which there is such abundance in Egypt ; it is therefore im-



possible that the little tender chickens just hatched should be able to withstand the inclemency of such weather ; whereas if hatched in spring. they become strong enough before summer sets in.

2. The great difficulty of collecting a sufficient quantity of fresh eggs during the summer, must be a decided objection for putting them into the ovens at that time, for in five or six days all the eggs become spoilt, and it takes some time to gather the required number of eggs ; indeed this is the reason which the natives themselves assign when questioned on the subject.

Whatever may be the weight attached to these opinions, yet the very circumstance of this artificial hatching being practised in spring furnishes us with a strong proof that its introduction not only in hot but in temperate climates is feasible.

In this firm conviction, and with the anxious desire of its adoption in other countries with success, I shall venture to offer a few remarks which I trust will be profitable.

Without waiting to shew the different modifications and improvements of which the Egyptian ovens are capable, I shall only mention that the system of large ovens is subject to many inconveniences.

1. This work becomes a monopoly to a few, and Government consequently levy a tax on the establishment.

2. The collecting of so many thousand fresh eggs becomes a work of labour and expense.

3. Taking care of the newly-hatched chickens would be attended with immense trouble and loss ; for at sunset they must be placed in a warm room, their food and drink must be attended to, and cleanliness, and other little cares, must not be neglected to rear them, whilst the oven-keeper must be looking after more fresh eggs to continue his subsistence. In fact, these serious inconveniences have been felt and remedies adopted.

In some districts people bring eggs to the ovens on their own account ; these they mark with ink or otherwise, and pay the proprietor for the use of the oven and his superintendence, taking the chickens away when hatched.

In other districts Government allot six or eight villages for the exclusive use of the oven-proprietors, to whom alone the villagers must sell the eggs. In this case the proprietor farms out a certain number of chickens to several poor families, either paying them when the fowls are sold for the trouble of rearing them up, or receiving back generally one half for the number of chickens given ; the persons taking as many above that number as they may have succeeded in rearing, as a compensation for their trouble.

A small oven worked by a single family on their own risk and profit, would be free from these inconveniences, and no doubt would remunerate them for their labour and expense.

An oven for that purpose ought to be of a rectangular shape, made of baked clay, 3 feet high and 3 feet broad, and from 4 to 6 feet long, with a double roof, so that the fire might be spread evenly on the whole. The lower roof should have a hole to allow of the heat passing into the oven where the eggs are. The upper roof must have an aperture for the smoke to issue, and if necessary to lessen the heat, and also for the purpose of introducing a thermometer. This aperture should be made like the lid of a box to lift up, for the greater convenience of removing the ashes, and renewing the fire; one of the walls of the oven should be made to open to admit of the hands being introduced to remove and shift the position of the eggs.

This oven moreover must be kept in a closed room, out of the way of any current of air; while the room where the oven is placed would be further useful for keeping the newly-hatched chickens till they gain strength.

Perhaps it would be an improvement if the oven were made with a double wall an inch or two apart, and the space filled up with some non-conductor of caloric, such as cork or triturated charcoal.

I think that any potter could make such an oven for the sum of five or ten shillings, and that this artificial hatching might thus be carried on in almost every country house, on a small scale, at all seasons of the year, particularly summer, with successful results. A high temperature must of course be more favourable than a low one for this process. In Egypt itself this fact is acknowledged by a common proverb among the people,

الكتكوت الفول ياكل ويموت كتكوت التوت ياكل ويموت  
كتكوت المزمج وياكل وينفرج

“The chicken of the bean (i. e. the chicken hatched at the season of beans) eat and die; the chicken of the mulberry eat and die; but the chicken of the apricot eat and thrive.” The season for beans is in February, and that of apricots in May.

Besides this, a curious circumstance once occurred which still more strongly proves that this is the best season for hatching. Three eggs were forgotten, and left in a basket in July in the house of Mr. Aime at Cairo; these were hatched spontaneously, and produced three chickens which thrived. Why should not then two or three hundred in a small oven succeed?



Before I conclude this brief account, I would just mention that this artificial mode of hatching will apply equally to turkey's eggs. Several Europeans had put them into the ovens in Egypt, and a few did succeed in being hatched, but Arabs being totally ignorant of the principles of the oven-hatching, they subjected them to the same conditions as fowl's eggs—hence the failure of the greater number. But that they might be hatched artificially was evident from some of the eggs which were put in having been hatched. By this means the supply of turkeys would also be cheap and abundant.

I have no doubt that if this artificial hatching of turkeys as well as fowls were introduced into any country, and commonly adopted in farm houses, it would tend greatly to the advantage of the land.

### *References to the Plate.*

*Fig.*

- 1st. General plan of the oven.
- 2d. Section of the corridor F G H I.
- 3d. Section of one cell in the direction of the corridor F G H I.
- 4th. Section of one cell in the direction of the corridor A B C D.
- 5th. Floor of the upper story of one cell.
- 6th. Floor of the upper story of the cell Y.
- 7th. Floor of the under story of a cell.
- 8th. Floor of the under story of a cell after the 14th day.
- 9th. Floor of the upper story of a cell after the 14th day.

ART. VII.—*Report on the Mortality among Officers and Men in H. M. Service in Bengal, and on the comparative salubrity of different Stations. By the late Dr. W. A. BURKE, Inspector-General of Hospitals.\**

TO W. W. BIRD, ESQ.

*President of the Committee for the Insurance of Lives in India.*

SIR,

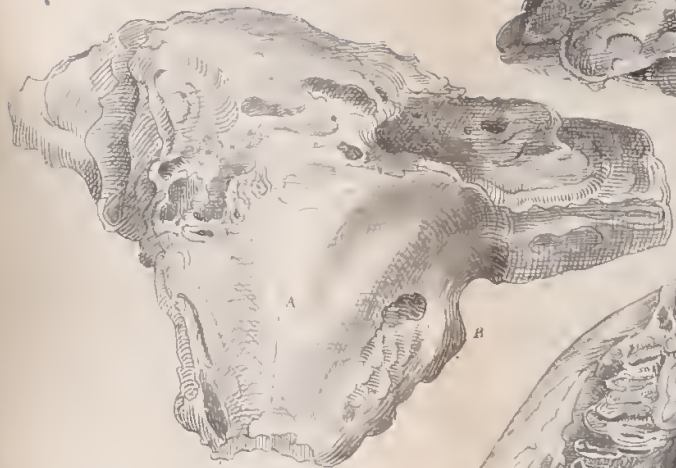
I have the honor to acknowledge the receipt of your letter, which a protracted and severe illness prevented my replying to as soon as I could have wished. I shall now endeavour as far as possible to comply with the request of the Committee in affording all the information in my power regarding mortality in the rank of officers as well as men

\* For this very valuable paper we are indebted to Mr. Martin, the Surgeon to the Native Hospital of Calcutta. Dr. Burke's tabulated returns form an important addition to our knowledge of the laws of vital statistics. In connexion with this paper the reader should consult Mr. H. T. Prinsep's paper on the "Value of Life in the Civil Service."—*Journal of the Asiatic Society*, 1832, p. 277, and 1837, p. 341; and his "Table of Mortality," founded on the registers of the Lower Orphan School, 1838, p. 818.—ED.

. 1° 9

. 1° 10

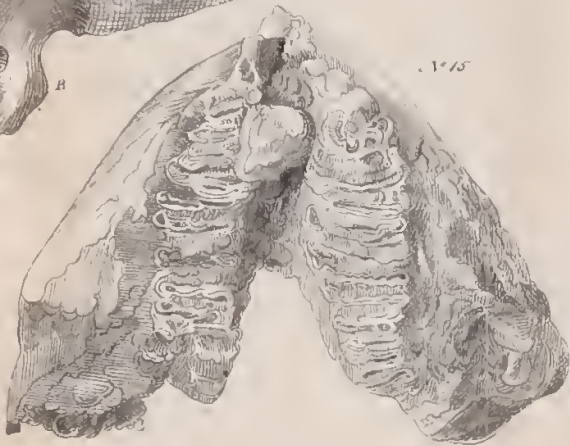
. Salweeni dent



Frontal view of . 1° 3 from . 1 to 3, breadth 5 inches or  
very nearly 11 inches from orbit to orbit



Found near  
Touren at Salween left bank  
. 1° 3 near Mouth of Salween  
October 1839

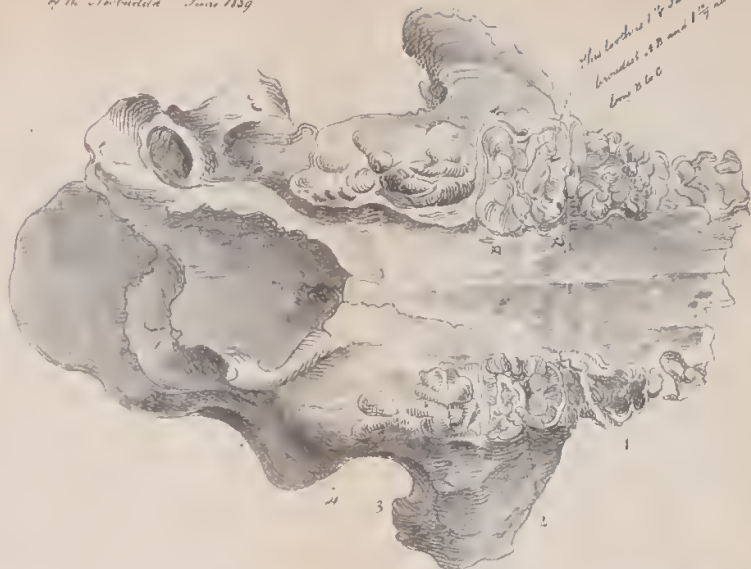


. 1° 15

Found near Mouth of Salween . 1° 3 near Mouth of Salween . May 1839

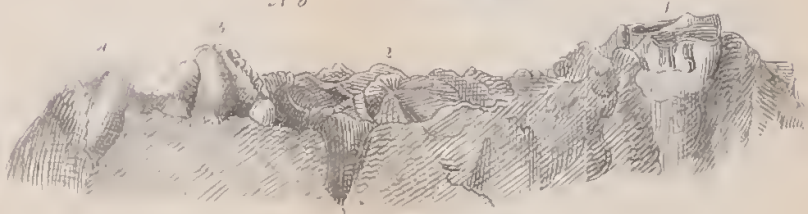
. 1° 11

Found 3 miles below Mouth of Salween, near Ford  
of the Salween . June 1839



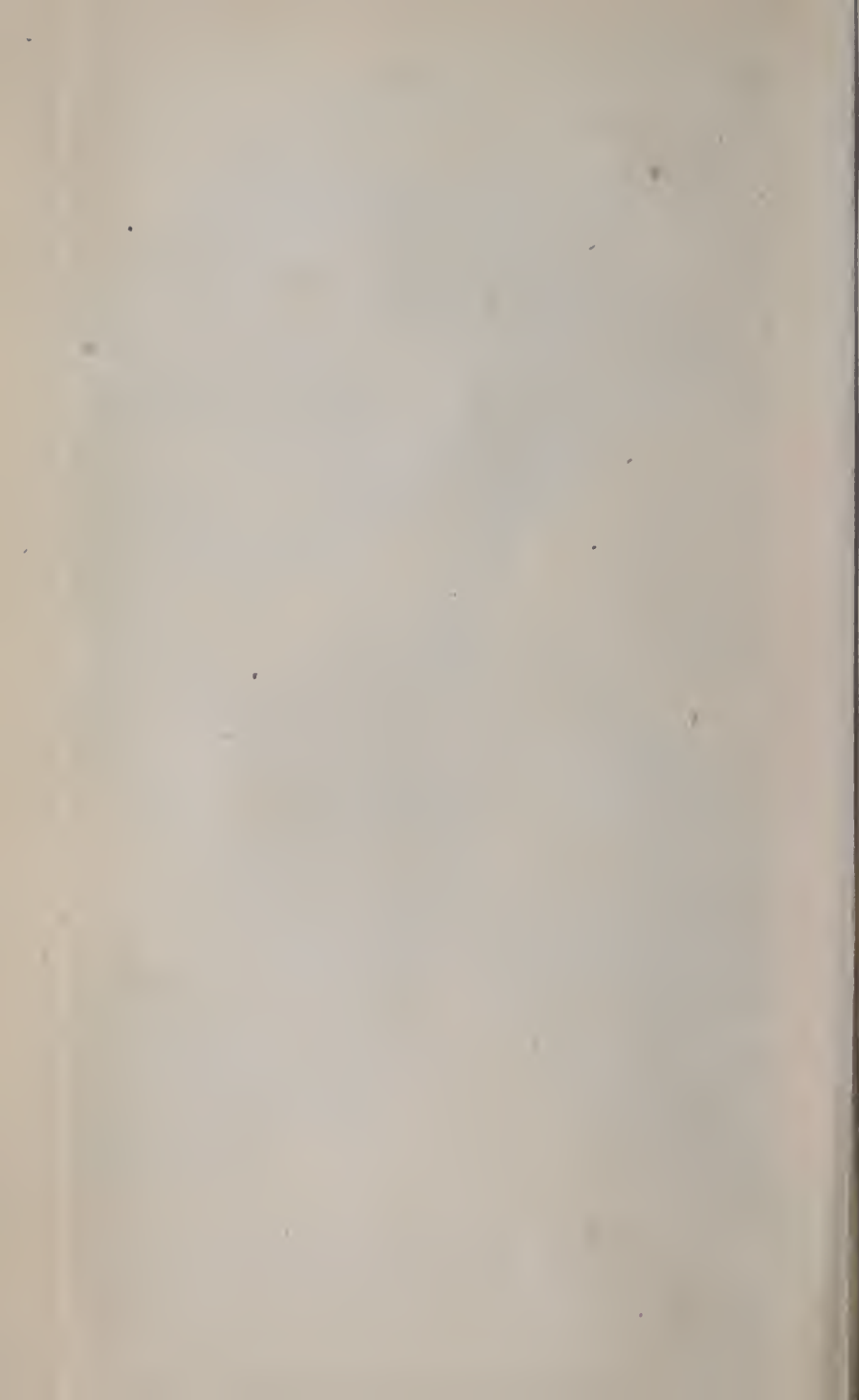
This skull is 1 1/2 in at the  
breadth . A B and 1 1/2 nearly  
long B to C

. 1° 0



. 1° 0

This face is so irregularly fractured that it gives representation



in His Majesty's service in Bengal, and the comparative salubrity or otherwise of the different Stations for European Troops in this command.

As to the healthiness of the Stations occupied by H. Majesty's Troops in Bengal, the following abstract from their Sick Returns will serve so far, to afford the requisite information for a period of four years, as to their comparative degree of health from 1830 to 1833 inclusive.

STATIONS.	Period of years,	Officers.			Men.			Women.			Children.		
		Average Strength,	Died of diseases in the Station,	Proportion of Deaths to Strength per cent.	Average Strength,	Died of diseases in the Station,	Proportion of Deaths to Strength per cent.	Average Strength,	Died of diseases in the Station,	Proportion of Deaths to Strength per cent.	Average Strength,	Died of diseases in the Station,	Proportion of Deaths to Strength per cent.
Meerut, .. ..	4 222	3	1.35	5,900	117	1.98	722	16	2.21	1,200	59	4.91	
Cawnpore, ..	4 226	7	3.10	5,950	271	4.55	914	37	4.04	1,572	145	9.22	
Ghazee pore, ..	4 109	3	2.75	3,754	143	3.80	456	15	3.29	845	56	6.62	
Berhampore, ..	4 118	9	7.62	3,515	236	6.77	473	27	5.71	865	70	8.09	
Chinsurah, ....	4 119	6	5.04	2,523	154	6.10	469	28	5.96	756	28	3.70	
Fort William, ..	4 119	7	5.88	3,097	235	7.59	447	48	10.73	761	124	16.29	
Kurnaul, .. ..	3 81	1	1.23	2,827	85	3.00	404	7	1.73	679	45	6.62	
Agra, .. ..	2 63	..	..	1,513	29	1.91	208	3	1.45	336	30	8.92	
Dinapore, .. ..	2 56	1	1.79	1,612	56	3.81	189	8	4.23	299	37	12.37	
Boglipore, ..	1 27	..	..	1,037	41	3.95	119	6	5.05	190	16	8.42	
Chirra Poonjee, ..	1 ..	..	..	38	6	15.79	..	..	..	..	..	..	
Landour, .. ..	4 ..	..	..	275	16	5.82	..	..	..	..	..	..	
Total, .....	..	..	..	32,041	1,389	4.33	4,401	195	4.43	7,503	610	8.30	

Among the Officers there were ten more deaths, but none of which occurred in any of the above Stations, viz.—

At Sea .....	2
On the River .....	3
At Madras .....	1
At Sultanpore Benares .....	1
At Allahabad .....	1
On the Hills .....	2

Giving the following proportions of deaths among the Officers His Majesty's service for four years, from 1830 to 1833 inclusive—

Total	Total	Total ratio of
Average strength	Deaths.	deaths to strength.
1140	47	412

Among the Men also there were other deaths, not within the scope of the foregoing Statement ; in consequence of which an abstract is give to include the whole of the casualties regimentally among all His Majesty's Troops throughout the Bengal command, for the period 1830 to 1833.

REGIMENTS.	Period of years.	Strength of Command, 1st January each year.	By disease in Regimental Hospitals.	By accidents, drowned, killed, &c.	Absent Deaths.	Grand Total of Deaths.	Proportion of Deaths to Strength per cent.	Invalided.	Remarks.
11th Lt. Dragoons, ..	4	2,626	75	2	15	92	3.50	18	In the Column 'absent Deaths,' are included, Deaths absent from Regiment in General and Detachment Hospitals, and other Casualties, such as died or drowned at sea, &c.
16th Lancers, .. ..	4	2,488	121	12	16	149	5.83	36	
3d. Buffs, .. ..	4	3,138	185	13	7	205	6.53	4	
13th Lt. Infantry, ..	4	3,217	87	6	4	97	3.01	13	
14th Foot, .. ..	1-1	1,350	58	6	3	67	4.96	0	
16th Ditto, .. ..	4	3,047	199	7	9	215	7.05	20	
26th Ditto, .. ..	4	3,417	53	3	21	80	2.32	10	
31st Ditto, .. ..	4	3,925	100	18	18	136	3.72	8	
38th Ditto, .. ..	4	3,927	146	20	22	188	4.78	4	
44th Ditto, .. ..	4	3,510	135	9	5	149	4.24	11	
49th Ditto, .. ..	4	2,909	110	11	2	223	7.66	8	
Total, .. ..	0	33,485	1,369	107	125	1,601	4.78	133	

Shewing the strength and deaths, and the ratio of deaths to strength, in His Majesty's Regiments, in the Bengal command.

	Total Average strength.	Total Deaths.	Total ratio of deaths to strength per cent.
Men, .....	33484	1601	4.78.

It is to be observed that the strength of the troops in this statement is as given in the Regimental Returns on the 1st January of each year, and which differs from the mean annual strength ; the latter being 32041, the ratio of total deaths to it is 4.99. In the different Stations of His Majesty's Regiments in the Presidency of Bengal, there is so little difference in the periods and duration of the seasons, as well as in their general temperature and climate, that it is upon the innate features of each Station itself, and from the data afforded by



its Returns, that its comparative salubrity would appear to be best deduced.

The steadiness or mutability of the climate, or considerable anomalies of weather, or physical properties, seem more to influence the health of the troops than either its heat or its cold, abstractedly considered.

The causes of sickness in many Stations must be traced to other sources than climate.

The soil of Bengal being composed of alluvial matter, formed by the detritus carried down by the great rivers, and accumulated for ages, there is a poison in the exhalations of such soils, the nature of which is unknown; but from it emanate all those species and varieties of fevers, (dependent on marsh miasma as their remote cause) so frequent in Bengal, and to which one general character appertains—periodicity, or remissions, and exacerbations.

A large proportion however of the cases of sickness and deaths among the European soldiers, may be more or less attributed to excesses, especially in the use of spirituous liquors.

The relative healthiness of each Station is according to the Returns, as follows, from 1830 to 1833 inclusive—

	Deaths to strength.
Fort William .....	7·59 per cent.
Berhampore .....	6·77
Chinsurah .....	6·10
Cawnpore .....	4·55
Boglipore .....	3·95
Dinapore .....	3·84
Ghazeepore .....	3·80
Kurnal .....	3·00
Meerut .....	1·98
Agra .....	1·91

There are given Classification Tables, taken from the Regimental Returns, shewing the different classes, numbers, ages, and deaths, of the soldiers of His Majesty's service in Bengal for the years 1826 to 1833, viz.

*Return of the different Classes of Men, Ages and Deaths of H. Majesty's Troops serving in the Bengal Command.*

1826.

CLASS.	Age.	11th Light Dragoons, from Bhurt-pore.		16th Light Dragoons, from Bhurt-pore.		13th Light Infantry, from Ava.		14th Foot, from Bhurt-pore.		31st Foot, from Eng-land.		38th Foot, from Ava.		44th Foot, from Ava.		47th Foot, from Ava.		59th Foot, from Bhurt-pore		87th Foot, from Ava.		Total.		Proportion of Deaths to Strength per cent.
		Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
From 18 to 20 years.		21	0	6	0	111	64	41	12	102	60	91	21	196	56	144	22	231	31	72	7	1,015	273	26.89
" 20 to 25 "		98	4	67	6	388	26	148	23	516	46	174	35	263	14	144	46	217	28	218	34	2,233	262	11.69
" 25 to 30 "		150	15	119	2	213	23	210	19	148	23	126	44	196	46	267	30	214	20	226	51	1,869	273	14.61
" 30 to 35 "		173	15	270	8	93	8	276	20	86	9	130	29	161	19	140	28	126	13	194	42	1,619	191	11.58
" 35 to 45 "		113	12	169	5	57	13	244	23	37	12	90	19	110	7	83	21	141	26	234	38	1,279	176	13.76
Under 18 years, ..		12	0	1	0	15	0	3	0	14	0	22	0	31	0	23	0	61	0	0	0	182	0	0
Unknown, .. ..		0	0	20	0	0	0	0	0	0	0	194	0	205	0	0	0	0	0	0	0	419	0	0

1826 being the first year these Returns were required, the term "unknown," was applied to those men whose ages the Surgeons could not then ascertain, but afterwards, when ascertained, they were taken into their proper and respective classes.

1827.

Class.	Age.	11th Light Dragoons.		16th Light Dragoons.		3d. Foot or Bufts.		13th Light Infantry.		14th Foot.		31st Foot.		39th Foot.		44th Foot.		47th Foot.		59th Foot.		Total.		Proportion of Deaths to Strength per cent.
		Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
From 18 to 20 years,		20	2	5	0	46	12	137	21	22	8	114	12	99	23	198	11	94	6	189	10	924	108	11.69
" 20 to 25 "		134	8	66	16	181	29	464	35	141	8	435	20	297	29	425	21	362	21	326	8	1,581	178	11.25
" 25 to 30 "		117	10	123	10	86	28	197	13	165	13	262	10	181	27	223	10	255	19	199	11	1,811	151	8.34
" 30 to 35 "		168	11	260	12	77	16	88	3	272	15	87	6	211	12	175	5	113	14	130	5	2,834	99	3.49
" 35 to 45 "		114	4	166	6	84	18	58	4	247	19	81	9	122	20	114	1	74	12	104	7	1,191	100	8.37
Under 18 years, ..		16	0	1	0	0	0	14	0	8	0	13	0	21	0	37	0	13	0	29	0	152	0	0
Unknown, ..		1	0	20	0	0	0	0	0	0	0	0	0	0	0	32	0	0	0	0	0	53	0	0

1828.

CLASS.	Age.	11th Light Dragoons.		16th Light Dragoons.		3d. Foot or Buffs.		13th Light Infantry.		14th Foot.		31st Foot.		38th Foot.		44th Foot.		47th Foot.		59th Foot.		Total.		Proportion of Deaths to Strength per cent.
		Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
	From 18 to 20 years.	16	2	2	0	52	5	35	16	19	3	62	4	86	8	98	6	88	2	181	4	639	50	7.82
	" 20 to 25 "	140	25	90	10	282	25	469	35	167	10	512	18	299	27	186	23	363	16	298	21	3,106	210	6.76
	" 25 to 30 "	124	15	93	8	133	19	200	27	155	7	285	22	180	20	213	8	243	25	178	11	1,804	162	8.98
	" 30 to 35 "	149	11	168	17	112	26	108	7	251	12	81	7	146	3	164	4	105	8	124	4	1,408	99	7.03
	" 35 to 45 "	159	11	217	11	120	19	57	11	261	28	89	10	129	13	117	3	67	7	97	5	1,313	118	8.98
	Under 15 years. ..	17	0	6	0	3	0	19	0	4	0	8	0	13	0	17	0	13	0	21	0	121	0	0
	Unknown, .. ..	0	0	0	0	49	0	0	0	0	0	5	0	0	0	23	0	0	0	0	0	77	0	0

1829.

Class.	Age.	11th Light Dragoons.		16th Light Dragoons.		3d. Foot or Bufts.		13th Light Infantry.		14th Foot.		16th Foot.		31st Foot.		38th Foot.		44th Foot.		49th Foot.		Total.		Proportion of Deaths to Strength per cent.
		Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
From 18 to 20 years.		5	2	2	2	53	7	13	9	3	0	22	9	3	2	48	0	22	4	39	3	210	38	18.09
" 20 to 25 "		122	12	148	41	390	26	413	50	140	5	98	16	535	21	386	20	497	15	199	14	2,927	223	7.62
" 25 to 30 "		140	9	107	5	129	28	202	32	150	7	127	18	329	10	236	13	193	8	200	26	1,813	156	8.60
" 30 to 35 "		146	5	123	4	142	6	118	10	256	5	169	6	84	3	129	6	153	4	188	35	1,508	81	5.57
" 35 to 40 "		150	8	214	14	153	6	52	8	271	19	405	9	90	2	137	8	131	2	87	29	1,490	105	7.04
Under 18 years, ..		16	0	12	0	9	0	19	0	5	0	10	0	14	0	6	0	14	0	7	0	112	0	0
Unknown, .. ..		0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	18	0	0	0	20	0	0



1830.

Class.	Age.	11th Light Dragoons.		16th Light Dragoons.		3d. Foot or Buffs.		13th Light Infantry.		14th Foot.		16th Foot.		26th Foot.		31st Foot.		38th Foot.		44th Foot.		49th Foot.		Total.		Proportion of Deaths to Strength per cent.
		Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
From 18 to 20 years.		60	0	25	2	17	1	166	0	159	0	28	1	38	1	12	0	55	0	400	0	12	1	972	6	0.62
" 20 to 22 "		81	2	32	5	82	5	165	2	0	5	111	3	132	1	131	3	114	8	0	7	204	6	1,052	47	4.47
" 22 to 24 "		120	6	124	1	195	8	131	8	0	6	119	9	224	0	149	4	256	9	0	8	109	8	1,427	67	4.69
" 25 to 30 "		191	5	127	2	298	16	144	12	0	10	207	18	306	7	475	10	353	10	412	11	155	22	2,668	123	4.60
" 30 to 35 "		142	5	114	5	149	9	120	2	382	35	145	16	110	1	130	3	135	6	97	6	246	10	1,770	98	5.53
" 35 to 45 "		50	5	221	11	131	2	68	2	87	7	207	17	94	6	132	0	152	8	39	5	44	3	1,225	66	5.38

1831.

Class.	Age	11th Light Dragoons.		16th Light Dragoons.		3d. Foot or Bufts.		13th Light Infantry.		16th Foot.		26th Foot.		31st Foot.		38th Foot.		44th Foot.		49th Foot.		Total.		Proportion of Deaths to Strength per cent.
		Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
	From 18 to 20 years.	21	0	4	1	13	0	165	0	11	0	98	0	1	0	27	0	360	0	16	0	722	1	0.11
	" 20 to 22 "	62	3	9	2	27	4	191	3	136	1	103	2	92	1	175	1	0	2	40	3	838	22	2.62
	" 22 to 24 "	129	4	89	2	121	11	131	8	119	15	183	6	111	4	211	11	0	19	15	6	1,145	86	7.51
	" 25 to 30 "	182	12	208	4	361	23	156	19	206	15	399	10	492	19	272	21	379	5	371	31	3,026	159	5.25
	" 30 to 35 "	150	4	93	6	161	7	80	6	111	11	33	4	146	6	154	8	114	7	222	17	1,261	76	6.01
	" 35 to 45 "	55	12	225	10	136	11	74	3	208	12	62	3	140	1	160	13	36	6	58	10	1,151	81	7.22
	Unknown, .. ..	0	0	23	0	0	0	0	0	0	0	0	0	9	0	14	0	5	0	0	0	51	0	0

1832.

Class.	Age.	11th Light Dragoons.		16th Light Dragoons.		3d Buffs.		13th Light Infantry.		16th Foot.		26th Foot.		31st Foot.		38th Foot.		44th Foot.		49th Foot.		Total.		Proportion of Deaths to strength per Cent
		Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
From 18 to 20 years		13	1	15	0	9	0	141	0	4	1	7	0	94	0	5	1	178	1	16	1	432	5	1.04
" 20 to 22 "		55	1	26	0	33	1	195	1	10	2	118	2	109	0	93	0	5	1	71	0	715	8	1.11
" 22 to 24 "		155	1	85	3	65	7	124	0	83	7	236	5	126	1	95	5	1	4	92	6	1062	59	3.67
" 25 to 30 "		238	4	214	6	310	33	157	9	189	12	207	9	181	31	383	19	319	11	240	19	2438	153	6.27
" 30 to 35 "		161	2	87	4	159	16	73	1	136	5	124	5	254	10	183	5	302	8	176	10	1655	66	3.99
" 35 to 45 "		26	12	229	13	167	15	73	0	209	14	105	1	56	8	199	6	50	1	115	6	1329	76	5.71
Under 18 years. ..		3	0	13	0	0	0	11	0	0	0	9	0	9	0	12	0	5	0	0	0	62	0	0

1833.

Class.	Age.	11th Light Dragoons.		16th Light Dragoons. Lancers.		3d Foot or Bufis.		13th Light Infantry.		16th Foot.		26th Foot.		31st Foot.		38th Foot.		44th Foot.		49th Foot.		Total.		Proportion of Deaths to strength per Cent.
		Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
From 18 to 20 years.		15	0	10	0	107	1	146	1	4	0	6	0	13	0	5	0	73	0	16	0	395	2	0.50
" 20 to 22 "		112	1	20	3	98	0	173	0	10	0	12	1	11	0	111	0	218	1	20	0	785	6	0.76
" 22 to 24 "		64	0	49	10	82	2	131	0	90	1	81	1	9	1	93	0	204	2	63	6	866	23	2.65
" 25 to 30 "		123	3	206	25	99	20	135	13	209	22	389	11	676	19	298	25	126	24	260	22	2512	184	7.32
" 30 to 35 "		133	1	82	4	195	8	76	3	138	9	164	1	147	3	175	16	121	8	183	23	1414	76	5.37
" 35 to 45 "		179	8	191	30	113	5	70	4	217	15	115	5	39	9	200	16	61	10	103	13	1288	113	8.77
Under 18 years.	..	3	0	10	0	7	0	9	0	14	0	7	0	10	0	9	0	4	0	0	0	73	0	0

General Abstract of the foregoing Returns, giving the Ratio of Deaths of each class for 8 years.

CLASS.	1830.	1831.	1832.	1833.	Average proportion from 1830 to 1833.	1836.	1837.	1838.	1839.	Average proportion from 1826 to 1829.	Mean average proportion for 8 years.
From 18 to 20 years.	....	0.62	0.14	1.04	0.50	0.58	26.89	11.69	7.82	16.12	8.35
" 20 to 25 "	....	4.58	5.07	2.39	1.71	3.44	11.69	1.125	6.76	9.33	6.39
" 25 to 30 "	....	4.60	5.25	6.27	7.32	5.86	14.61	8.34	8.98	10.13	8.25
" 30 to 35 "	....	5.53	6.01	3.99	5.37	5.22	11.58	3.49	7.03	6.92	6.07
" 35 to 45 "	....	5.38	7.28	5.71	8.77	6.78	13.76	8.57	8.98	9.54	8.16



The General Abstract of the foregoing shews that for the four first years, viz. 1826-27-28 and 29 the ratio of deaths is,

From the age of 18 to 20 years 16·12 per cent.

„	20 to 25	„	9·33	„
„	25 to 30	„	10·13	„
„	30 to 35	„	6·92	„
„	35 to 45	„	9·54	„

For the four last years, viz. 1830-31-32 and 33, the ratio of deaths is,

From the age of 18 to 20 years 0·58 per cent.

„	20 to 22	„	2·24	} 3·44
„	22 to 24	„	4·63	
„	25 to 30	„	5·86	
„	30 to 35	„	5·22	
„	35 to 45	„	6·78	

There will be observed a striking difference between the ratio of deaths in each class of the two periods of four years; viz. first, from 1826 to 1829, and, second, from 1830 inclusive. But there is to be taken into consideration, that in the first period there are included the casualties (in 1826) of the Troops His Majesty's service who had been in active service at Bhurtpore, Ava, and Arrakan. During the campaigns, in the latter places especially, the deaths from disease among the young soldiers recently arrived in India, was very great.

Thus in the 13th Regiment Light Infantry, that had arrived in India in May 1823, and was composed chiefly of young soldiers, the mortality was,

	Strength.	Deaths.	Proportion.
At Bengal from May } to December, 1823 }	653	45	6·89 for 8 months
At Ava in. . . . 1824	608	231	37·99
Do. do. . . . 1825	377	115	30·50

In the 38th Regiment, which arrived in Bengal in May 1823, the mortality was,

	Strength.	Deaths.	Proportion.
In 1822 in Bengal . . .	743	94	12·65 per cent.
In 1823 do. . . . .	695	52	7·48
In 1824 in Ava . . .	643	185	28·77
In 1825 do. . . . .	458	162	35·37

In the 44th Regiment, which arrived from England in November 1822, the mortality was,

	Strength.	Deaths.	Proportion:
In 1823 in Bengal	661	73	11·43 per cent.
In 1824 at Chittagong } and Arrakan }	588	88	14·96
In 1825 at Arrakan	500	203	40·60

There is a difference however in the mortality of young recruits of Regiments when on active service, and the contrary ; as, for example, in the 13th Light Infantry, which in 1826 in Bengal was joined by 600 recruits, of whom there died in that year 79, being a proportion of 13·16 per cent in Bengal.

His Majesty's 31st Regiment arrived in Bengal in June 1825, and was joined in that year by 500 recruits, of whom there died 65, a proportion of 11 per cent, in Bengal.

The volunteers are generally men from the age of 30 to 35, in which class the ratio of deaths from 1826 to 1829 (including a period of active service) was 6·92, while during the same period, the ratio in the class from 18 to 20 years was 16·12 per cent.

Besides the sending from England of lads too young for the service in India, there was another important circumstance as affecting their health, which was that of their having been sent out at improper periods ; for they arrived in Bengal at the hot and rainy seasons, found to be more especially obnoxious to the lad or boy recruits ; and of such, unfortunately, was the chief part of those sent out in 1826 to 1829, as well as before.

From the difference of habits of military and civil life, young soldiers are in every climate peculiarly liable to disease, and *cæteris paribus* the younger the more susceptible to feel the change ; and this change has a direct tendency to induce a highly inflammatory diathesis, leading to such explosions of disease as witnessed here among the recruits. The tendency to disease exists it is true in all seasons in India in the young and plethoric, but it is in the hot and rainy seasons, and particularly at the commencement and termination of the rains, that endemial diseases are most dangerous, and fatal ; yet this was the very time at which these recruits principally arrived in Bengal.

I took the earliest opportunity, and seized every occasion, to make the strongest representations on these important subjects, and of sending out soldiers for His Majesty's service to India at *proper*

age, and *season*; and there are on record my memorials on these subjects to the Commander-in-Chief in India, and to the Medical Department in England—of December 23d, 1826; May 31st, 1827; 6th January, 1828; and December, 1829—and upon which the Home authorities at last acted. In these memorials it was represented by me,

1st. That the soldier should arrive in India at the *age* and *period* when he can be of the greatest use when called upon for actual service. That age to be 24 or 26, or full grown manhood, as most favourable to health, and least so to disease in India.

2nd. That recruits and soldiers should be embarked in England, so as to arrive in Bengal at the commencement of the cool season, when they might be *marched* to their several Stations up the country, instead of *proceeding* by the river.

These memorials I accompanied with various statements; such as those in this communication, in proof of the great comparative mortality among the lad recruits particularly; as also the comparative mortality between the soldiers arriving in Bengal in the hot and in the cool season, as by the following abstract of statements from December 1825, to July 1829, of casualties of detachments His Majesty's service, arriving in Bengal from England, being,

In the cold season, per cent,	0.75
In the hot season,	3.0
Proceeding by water to join their corps,	6.50
On marching to join their corps,	0.50
Average of casualties on the voyage out,	1.50
Average of casualties from the date of arrival in Bengal to joining their corps,	6.75
Ditto of casualties of the whole of the detachments from their leaving England to join their corps in Bengal,	8.0

The accompanying Returns\* elucidate these subjects still further, shewing the state of each Regiment His Majesty's service, their strength, the numbers who joined, and that died, from the date of their arrival in the Bengal command to the 31st December last.

On consulting the monthly admissions in the returns of sick, an abstract from which is given on the other side, the number of cases of disease (and they are particularly of the acute kind) and casualties, will be observed to correspond in a most remarkable manner with the range of the thermometer, especially at the Stations in Upper India; and so great is the difference between the cold season and the

\* The Returns alluded to, will form an appendix to the next Number.—Ed.

hot, that a partial illustration is afforded of the influence of climate which sets all theory on the subject at defiance.

Among the soldiers exposed to the same degree of heat, the influence of the ingesta seems to be more powerfully injurious to the constitution than climate. There is a marked difference in the ratio of sick and casualties between the Cavalry and Infantry Regiments, stationed in the same cantonments, of His Majesty's service in India, in favour of the latter. In the Cavalry the soldier's pay is greater, and among them a superabundance of stimulant food and drink keeps so great a number in an almost perpetual state of proximity to inflammatory diseases.

During the cold months the men continually expose themselves, especially in the Upper Stations, to the direct rays of the sun, which is a great cause of disease, even when all accumulation of heat is prevented by the coolness of the breeze, for then the infringing of the direct rays of the sun upon an opaque body causes a greater increase of temperature than is observable by a thermometer.

*Abstract from the Monthly Returns of Sick shewing the proportion of the average daily sick, and of deaths to strength per cent for four years.*

Months,	Proportion of the average daily sick to strength per cent.				Total proportion of the average daily sick to strength per cent.	Proportion of deaths to strength per cent.				Total proportion of deaths to strength per cent.
	1830	1831	1832	1833		1830	1831	1832	1833	
January, ..	7.12	5.94	6.33	5.45	6.21	26	23	31	15	24
February, ..	7.58	5.85	5.96	5.52	6.23	20	10	12	18	15
March, ..	8.64	5.80	6.10	5.89	6.61	18	19	15	15	17
April, ....	9.24	7.14	6.88	6.22	7.37	28	19	17	15	20
May, ....	9.75	8.47	7.88	6.78	8.22	20	44	25	25	29
June, ....	9.34	8.47	7.36	7.19	8.09	31	37	32	37	34
July, ....	9.14	8.36	7.61	7.72	8.21	30	44	34	74	46
August, ....	9.49	9.10	7.74	8.29	8.65	34	47	35	74	48
September, ..	10.71	8.32	8.03	9.79	9.21	71	46	43	1.15	69
October, ..	8.92	8.12	8.20	8.29	8.36	47	64	52	30	48
November, ..	8.16	7.18	7.05	7.79	7.54	51	60	43	35	47
December, ..	6.77	7.06	6.23	7.40	6.86	33	22	32	44	33
Total, ....	8.72	7.48	7.11	7.18	7.62	4.15	4.39	3.73	4.98	4.31

The sick at Landour and Chirra Poongee are not included in the above.



By the returns for four years, the minimum of sickness and deaths occurs in February. January and it are the driest months. The maximum of sickness and deaths occurs in September; being the cessation of the rains, when the exhalations have brought the surface to the consistence of mud—a state that appears especially to generate the miasmata producing fevers, &c.

#### *Berhampore.*

With respect to the localities of the Stations “as affecting their salubrity or otherwise,” as required by the Committee, I have in reference to the return of the sick, &c. at the several Stations, given at the commencement, further to add, that at the Station of Berhampore, the Barracks are so placed, that one particularly is close to a large stagnant tank, into which the sewers of the Barracks and necessaries, &c. empty themselves, so that in the dry and hot season especially, the men are enveloped in the stench from it. That the influence of its exhalations spreads far, I have no doubt. The malaria from it, as well as numerous other sources, is of course the active cause of much of the mischief that infests the Station of Berhampore.

For the period of four years, from 1830 to 1833, inclusive, the average proportions of deaths to strength per cent was, *at Berhampore*,

Officers .....	7·62 per cent per annum.
Men .....	6·77
Women .....	5·71
Children .....	8·09

Cholera prevailed epidemically in Berhampore in 1829 and 1830, and commenced in the temporary sheds recently erected, (not far from the great tank before mentioned) for part of His Majesty's troops; after which it appeared in the women's quarters—a low one-storied brick-building; afterwards on the ground story; and then in the upper story of the Barracks next the great tank, &c.

#### *Fort William.*

In the Station of Fort William, in the Barracks generally occupied by His Majesty's troops, the apartments for the men are deficient in height and ventilation. The buildings are too crowded together. The estimate of space, and of domestic convenience, has been too confined for the climate.

From the crowding of the buildings, and height and proximity of the fortifications, the radiation of heat is not only very great, but there is prevented the dissipation of those malarious vapours of which there appears to be so copious a supply from various sources in Fort William.



One of the consequences of all these is, in the warm season especially, the men feel so oppressed at night that they leave their rooms and expose themselves to all the causes and bad effects of suppressed transpiration.

The average ratio of mortality in His Majesty's troops quartered in Fort William is as follows, for four years from 1830 to 1833—

Officers .....	5·88 per cent per annum.
Men .....	7·59
Women .....	10·73
Children .....	16·29

Fort William is one of the worst, if not the very worst, of the Military Stations in India for children.

#### *Cawnpore.*

In the Station of Cawnpore for the period of four years, from 1830 to 1833, the average proportion of deaths to strength is,

Officers .....	3·10 per cent per annum.
Men .....	4·55
Women .....	4·04
Children .....	9·22

As to the locality of this cantonment, none of the Barrack buildings come close to the river, excepting the Hospital in which the sick of the King's Regiment of Infantry are treated. The soil rests on a substratum of Kunkur, which is favourable to the dryness of the Station. The declivity of the site secures it against any accumulation of moisture; the drainage is also facilitated by several small ravines or gullies, which intersect the cantonment, each of which during the rainy season becomes a streamlet; thus the water does not lodge, but runs quickly off into the river (above which all the Barracks are sufficiently elevated) or it is speedily absorbed, so that the wet season at Cawnpore is generally found pleasanter than in many other Stations in Upper or Central India.

The site of the Barracks of His Majesty's Infantry Regiment is pretty high, that of the King's Cavalry Regiment not so high; but that of all however is sufficiently elevated to allow of the water passing off.

The ground in the rear of the King's Infantry Regiment's Barracks is broken in many places, by the violence of the periodical rains, into deep fissures and ravines, containing numerous cavities, which, however individually small, may form in the aggregate a consider-

able deposit of stagnant water, which before its final evaporation cannot fail to be an agent more or less active in the generation of miasmata.

In the Barracks for the European troops here, the plans adopted by the architect would appear to have arisen from the idea of a Regiment standing in open column of companies, which however ingenious in a military point of view, is rather objectionable in a medical one, as it makes one building a screen to another, and thus opposes perfect perfilation, an object of paramount importance where masses of men are to be congregated together, and where a perpetual current of air becomes the grand neutralizer of insalubrious miasmata.

The prevailing winds are from the west and east, varying to the north or south. If the buildings were placed in echelon this might be prevented.

#### *Meerut.*

In the Station of Meerut the locality is in Meerut deemed good. There are a few jheels and swamps in the vicinity ; but not near, or considerable enough to have much effect on the health of the troops. The country around is flat ; the soil is sandy, with a slight declination to south sufficient to carry off the heavy rains into the Kallee Nuddy to the eastward.

Notwithstanding the northern latitude of Meerut, considerably without the tropics, and in the third climate, the heat is intense in the dry and hot season, and tropical diseases are prevalent during the hot and rainy seasons. For the period of four years, from 1830 to 1833, the average proportion of deaths to strength is, at Meerut,

Officers .....	1·35	pèr cent per annum.
Men.....	1·98	
Women .....	2·21	
Children .....	4·91	

The diseases are such as arise from sudden and considerable variations of temperature and malaria, and especially among the soldiers, aggravated by exposure to the sun and intemperance.

#### *Dinapore.*

In the Station of Dinapore the aspect of the Barracks being the reverse of what it should have been in respect to the prevailing winds, free perfilation is prevented. The roof is flat and chunamed ; the length of each building is 800 feet, and width 20 feet ; there is a verandah on each side.

The masses of men, women, and children in these Barracks, is another cause of the unhealthiness experienced generally in them by the troops. There are no separate accommodations for the women and children. The doors and windows are jealoused.

The *cold* weather here was generally ushered in by severe hepatic and dysenteric affections. And in the *hot* season there were severe ardent fevers, very sudden in their operation, and often terminating in apoplexy.

In His Majesty's 13th Light Infantry for the period of two years, for 1830 and 1831 last, at Dinapore, the average proportion of deaths to strength was,

Officers.....	1·79 per cent per annum.
Men .....	3·84
Women.....	4·23
Children .....	12·37

The facility with which the men could obtain toddy, and deleterious liquors in excess, was one great source of disease and mortality, as also the difficulty of confining the men within bounds, there being no enclosure to the Barrack compound.

The 13th being a Light Infantry corps, their movements were more likely to expose them to profuse perspiration, and consequently to more frequent alterations of heat and cold, with the usual bad effects.

#### *Boglipore.*

In the Station of Boglipore the Barracks formerly occupied by His Majesty's 3rd Buffs, were merely a set of buildings erected temporarily in 1825 as stables for some Native Cavalry, and were very inimical to health.

#### *Ghazeepore.*

The Station of Ghazeepore appears to hold a middle station as to healthiness. The soil is readily permeable by the rain falling on its surface, which sinking down to a very considerable depth before it finds a hard bottom to detain it, is soon out of reach of superficial evaporation, and cannot afford the constant supply of moisture necessary in co-operation with other agents to produce the maturity of marsh miasmata. From the continuation of these circumstances it might *a priori* be thought that the Station possesses to a great degree an immunity from marsh miasmata.

For the period of four years, from 1830 to 1833, the average proportion of deaths to strength is,

Officers.....	2.75 per cent per annum.
Men....	3.80
Women .....	3.29
Children .....	6.62

### *Kurnaul.*

In the Station of Kurnaul the locality of the Barracks for His Majesty's Regiment is the best the place afforded. The soil generally is light and sandy on the surface, but at the depth of 12 or 15 inches it is a stiff clay; in some parts however it is calcareous, (and of which the natives make lime). The large canal in the immediate vicinity forms an irregular semicircle near the Station, and tends in a great measure to drain that part.

For the period of three years, from 1831 to 1833, inclusive, in which it has been occupied by a King's Regiment, the average proportion of deaths to strength per cent is,

Officers .....	1.23 per cent per annum.
Men .....	3.00
Women .....	1.73
Children .....	6.62

### *Agra.*

In the Station of Agra the cantonment for His Majesty's troops is stated to be elevated about 170 feet above the level of the river Jumna, from which the distance is about the same as from the Fort, that is  $1\frac{1}{2}$  mile. The immediate banks of the river are deeply indented with water-courses, which serve to convey the rain water into the river.

The 13th Light Infantry Regiment has been healthy ever since its arrival there, a period of two years, in which there died 29 men; but almost all of them had the foundation of their disease laid in Dinapore. This comparative healthiness, as far as locality is concerned, arises from the cantonment enjoying constant ventilation, the water running immediately off, the drainage being good, and there being no stagnant pools, or sources of malaria in the vicinity, and especially that the troops are well accommodated, and so are the sick.

Setting aside intemperance, which is the cause of so many diseases of the soldier in India, they may be said to have enjoyed a state of health at Agra almost equal to what a Regiment would be found to do in the healthiest parts of Europe.

For the period of two years, for 1832 and 1833, in which there has been a King's Regiment in Agra, the average proportion of deaths to strength per cent is,

Officers .....	
Men .....	1.91
Women .....	1.45
Children.....	8.92

I have the honour, &c.

(Signed) W. R. BURKE,

Inspect. Gen. Hospitals H. Majesty's Forces in India.

ART. VIII.—*Observations on the Burmese and Munipoor Varnish Tree, "Melanorrhœa usitata," which has lately blossomed in the Honorable Company's Botanic Garden. By N. WALLICH, M.D.*

When I published my account of this tree in 1830,\* I had only met with it in fruit, and was obliged to confine the description of the flower to what could be gathered from a few decayed and not very perfect samples in my possession. The generic character was chiefly derived from specimens of another species, *Melanorrhœa glabra*,† a native of the coast of Tenasserim. As I have recently had a tree of *M. usitata* in flower in this garden, I am able to furnish the following details, accompanied by a lithographic sketch of a flowering panicle, from a drawing made by one of the painters of the establishment.

The individual tree to which I allude is one among several which were raised from Munipoor seeds presented by Mr. George Swinton. The seeds were sown in July 1827, and began germinating exactly a fortnight afterward. About the same period some seeds that had been procured from Martaban, being more fresh, sprang up seven days after being put into the ground. The tree which has blossomed is the largest among the seventeen individuals which we at present possess. It measures in height about 22 feet, with a clean stem of seven feet, having a circumference near the base of 14 inches. It has not many branches, and is now very scantily furnished with leaves. It began opening its flowers on the 20th of January last, and continued nearly one whole month in flower. There are at present a small number of fruits on the tree, which I expect will ripen in the course of next month.

\* *Plantæ Asiat. Rar.* 1. p. 9. tab. 11 and 12.

† *Ibid* 3. p. 50 ab. 283.



Fossil *Buffalo* from  
Khangabad in the collection  
of Mr. Fraser

7 in base of horn

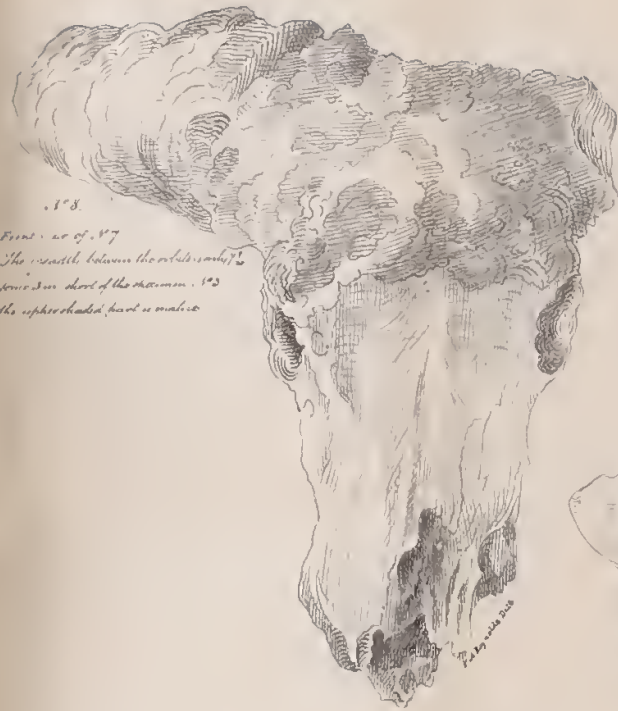
1 1/2 in

1 1/2 in

Concave

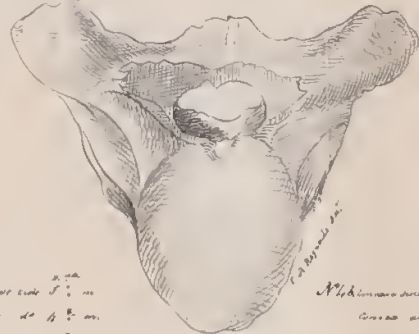
1 1/2 in

Concave



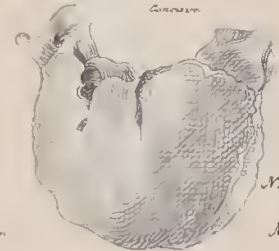
188

Front view of 187  
The breadth between the orbits is about  
same as short of the rostrum. 188  
the sphenoidal part is smaller



189

189  
Length of rostrum side 5 1/2 in  
Circum. at 4 1/2 in  
Depth at 2 1/2 in



190  
Length of rostrum side 1 1/2 in  
Circum. at 1 1/2 in  
Depth at 3 1/2 in



191  
Length of rostrum side 1 1/2 in  
Circum. at 1 1/2 in  
Depth at 3 1/2 in



192  
Length of rostrum side 1 1/2 in  
Circum. at 1 1/2 in  
Depth at 3 1/2 in

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Panicles of flowers terminal on leafless branchlets, broad-oval, spreading, much and loosely subdivided, 12 to 16 inches wide at the base; the divisions cylindric, covered with much soft down. There is a small linear, caducous bract under each branch. Flowers white, inodorous, rather large, two or three in each fascicle, supported by pedicels half an inch to an inch in length. Calyx smooth, consisting of five sepals which are marginally soldered together into one, forming a conical, attenuated, obtuse hood, slightly marked with parallel veins; it falls off the instant the corolla is ready to expand, leaving an annular vestige on the peduncle immediately under the corolla; its base circular, irregularly slit a little way, in four or five places. *Petals* white, imbricating and slightly contorted in estivation, lanceolate-oblong, rather obtuse, with entire, a little undulated, ciliated margins, thin and membranous, pubescent on both sides, minutely reticulated, half an inch long. *Torus* large, fleshy, hemispherical, pitted for the insertion of the stamens, its base five-lobed. *Stamens* very numerous, straight, spreading in all directions, half the length of the petals; *filaments* subulate, smooth; *anthers* oval, versatile. *Ovary* very small, obliquely oval, smooth, supported from the centre of the torus by a short, cylindric, pubescent pedicel, one-celled; ovule suspended from a lateral ascending funicle. *Style* rising obliquely from the vertex of the ovary, subulate, not reaching to the ends of the stamens. *Stigma* minute, obtuse.

The accompanying figure represents a panicle of flower reduced to one half of its natural size. Fig. 1, flower-bud, the hooded calyx commencing to detach itself, and at Fig. 3, completely separate. Fig. 2, corolla in estivation. Fig. 4, the same fully expanded. Fig. 5, petals separate, showing the pitted torus. Fig. 6, ovary opened showing the insertion of the ovule.

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ART. IX.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 2d January, 1839.

The Right REV. the LORD BISHOP of Calcutta, Vice-President, in the chair.

The Proceedings of the last Meeting were read.

The Meeting then proceeded to the election of Office-bearers for the ensuing year, when the following gentlemen were chosen:—

The Right Rev. LORD BISHOP of Calcutta,	}	Were elected Vice-Presidents.	
The Honble. Sir J. P. GRANT,			
H. T. PRINSEP, Esq.,			
Col D. MACLEOD,			
Mr. W. CRACROFT,	}	Members of the Committee of Papers.	
Mr. W. P. GRANT,			
Mr. D. HARE,			
Dr. Geo. EVANS,			
Dr. MC'LELLAND,			
	Capt. FORBES,	}	
	Dr. STEWART,		
	and		
	Dr. WALLICH.		

Dr. GOODEVE and Mr. R. O'SHAUGHNESSY, proposed at the last Meeting, were balloted for, and duly elected Members of the Society.

Messrs. A. PORTEOUS and J. COWIE were proposed by the Officiating Secretary, seconded by the Vice-President.

Dr. O'SHAUGHNESSY apprised the Meeting that the Committee of Finance had recommended 20 rupees per mensem, as an increase to the Clerk HERAMBANATH THAKUR's salary.

Resolved,—That the meeting approve of the decision of the Committee of Finance, and that it take effect from the date of the Clerk's application.

Read a letter from J. K. KANE, Esq., Secretary of the American Philosophical Society, acknowledging receipt of the first part of vols. 19 and 20 of the *Asiatic Researches*, and vols. 5 and 6 of the *Journal of the Asiatic Society*.

*Library.*

Read a letter from J. VAUGHAN, Esq., Librarian of the American Philosophical Society, forwarding the following works for presentation to the Society—

Transactions of the American Philosophical Society, Vol 6, Part I, New Series.

Transactions of the Literary and Historical Committee of the Society.

Read a letter from M. CASSIN, Book Agent of the Society in Paris, enclosing account of sales of oriental publications sold by him in France, and forwarding from the proceeds thereof several recent publications for the use of the Society. He had likewise sent several books for sale in this country.

Resolved,—That the books for sale be advertized on the cover of the *Journal Asiatic Society*, with their prices.

A brochure by the Royal Society of Cornwall, presented by Capt. F. JENKINS through Dr. WALLICH.

Meteorological Registers kept at the Mauritius, during the last six months of 1836, and first six months of 1837, were presented by M JULIEN DESJARDINS, Secretary of the Natural History Society of the Mauritius.

Read a letter from MADHUSHUDANA GUPTA, forwarding specimens of the plates for the "*Sarira Vidya*" engraved by Native artists.

The Officiating Secretary with reference to the very high cost and inferior execution of the plates submitted, proposed a reference by the overland mail to Professors QUAIN and PAXTON, by whose friendly co-operation he had no doubt casts of their anatomical wood-cuts could be procured at half the price, and in half the time the Native artist would require.

The proposition was seconded by Baboo RAMCOMUL SEN, and unanimously agreed to.

*Antiquities.*

Read a letter from J. P. GRANT, Esq., Officiating Secretary to the Government of India, intimating that measures have been taken by the local authorities to prevent any further dismantling of the *Kanurak* temple, or Black Pagoda.

*Museum.*

Read a letter from Major HAY, with reference to a Museum of Natural History collected by him from the Cape and the Eastern Archipelago.

Resolved,—That the Officiating Secretary be requested to inform Major HAY, that the present state of their funds entirely precludes their purchase of his collection, but that the Society will be happy to allow the use of their rooms for the reception of the specimens, and to employ their establishment for their care and preservation. It was further decided t<sup>n</sup>at the Society make a representation Government on the subject.

The Officiating Secretary then laid before the Meeting the Annual Report of the past year's transactions.

[This Report will appear in a subsequent number.]

Baboo RAMCOMUL SEN submitted the Account Current of the Society for the past year, in which a balance of rupees 7,755 : 1 : 2 stands in favour of the Society on the 31st December, 1838.

[The Account Current will be found at the end.]

Proposed by Baboo RAMCOMUL SEN, seconded by Mr. HARE, and unanimously agreed, that a sum of rupees 4,500 be invested in Company's five per cent. Government Securities.

The Officiating Secretary informed the Meeting, that with reference to a communication made by him to Messrs. SHERRIFF and Co. regarding the repairs of the Society's house, that these architects report that the roof of the house is in a very ruinous state, and unless immediate steps are taken, serious danger is apprehended.

Mr. H. T. PRINSEP remarked that Mr. JAMES PRINSEP thought that additional rooms might be built for the Museum.

Resolved,—That Col. MACLEOD be requested to furnish a plan to that effect, and an estimate of the probable expense, in order that the Society may determine on the subject at their next Meeting.

After the conclusion of the routine business, Mr. H. T. PRINSEP called the attention of the Members present to M. MASSON's large collection of coins and relics then exhibited on the table.

This collection Mr. PRINSEP stated had been made from the funds advanced to M. MASSON by the Government; the proceeds having been forwarded through Col. POTTINGER to Bombay for transmission to the Honble. Company's Museum in England, were ordered by the Right Honble. the Governor General to be first sent to Calcutta for examination and arrangement by the gentlemen connected with this Society.

The articles having consequently been sent round in the "John Adam" from Bombay, were laid upon the table of the Society in order that if any gentlemen were disposed to undertake their examination and arrangement, the Society might form them into a Committee for the purpose.

The collection consisted of some hundred gold and silver coins and several thousand copper coins.

Some discussion arose as to the steps to be taken by the Society with this collection. By an unfortunate coincidence, all the leading numismatologists of the Society being absent from Calcutta, either through illness (as Mr. JAMES PRINSEP and Professor MALAN,) or on Military duty (as Col. STACY, Capt. CUNNINGHAM, and Mr. TREGEAR) it was suggested that the Government be requested to forward the collection to England, where the Court of Directors might refer the examination to Mr. J. PRINSEP, who will no doubt be happy to meet the wishes of the Court.



# Dr. The Asiatic Society,

<i>Establishment and Charges.</i>		
To paid Secretary's Office Establishment, from December 1837 to 30th November, 1838.....	722	0 11
„ Ditto for Contingent charges.....	53	0 0
<i>Oriental Library.</i>		
„ Paid Establishment for the Custody of Oriental Books deposited by Government, from ditto to ditto, at 78 Rs.	236	0 0
<i>Library and Charges.</i>		
„ Paid Establishment, from ditto to ditto....	1,627	15 0
„ Contingent Charges.....	325	2 5
„ For binding Books.....	285	12 0
	2,238	13 5
<i>Museum.</i>		
„ Paid Establishment, from ditto to ditto ..	2,619	11 6
„ Contingent Charges.....	705	7 6
„ Making Cabinets.....	246	0 0
	3,571	3 0
		7,621 1 4
<i>Printing.</i>		
„ Paid Mr. Huttman for printing 20th vol. 1st. part of the Researches....	925	0 0
„ Kossinauth for plates.....	244	0 0
„ Mr. Huttman for Paper for ditto.....	120	0 0
„ Munoololl for Oriental Catalogues.....	250	0 0
		1,539 0 0
<i>Building.</i>		
„ Paid for making a Cook Room for the Librarian in the Secretary's Office.....		199 12 1
<i>Journal Asiatic Society.</i>		
„ Paid J. Prinsep, Esq. for the Journal Asiatic Society being supplied to the Members of the Society in 1837.....	2,190	8 0
„ Remitted to England for the bust of Mr. Wilson.....	1,000	0 0
<i>Establishment and Charges for the Statistical Committee.</i>		
„ Paid Establishment for the Statistical Committee..	383	3 0
„ Balance in the Bank of Bengal.....	7,755	1 2
Co's, Rupees.....	20,688	9 7

for the year 1838.

Cr.

By Balance of account closed up to 31st Dec. 1837...	2,323 3 10
Members.	
„ Collections made for quarterly Contributions and admission fee from January to December, 1838....	7,818 15 6
Subscriptions for Busts.	
„ Subscriptions made for the Busts of Sir William Jones, H. T. Colebrooke, and H. H. Wilson....	1,778 0 0
Government Allowance.	9,626 15 6
„ Cash received from the Sub-Treasurer, allowance for the Custody of Oriental Books transferred from the College of Fort William, from 1st Dec. 1837 to 30th Nov. 1838, at 78 Rs.....	936 0 0
„ Ditto ditto for the Museum of the Society from ditto to ditto at 200 Rs.....	2,400 0 0
„ Ditto ditto towards the Publication of Oriental Works, and Works on Instruction in the Eastern languages, for Oct. and Nov. 1838 at 500 Rs.....	1,000 0 0
„ J. Prinsep, Esq. balance of the Fund appropriated for the publication of Oriental Books.....	3,599 1 1
„ Sub-Treasurer, interest on the Government Securities deposited with the Govt. Agent up to 30th June, 1838...	803 5 2
	4,402 6 3
Co's. Rupees.....	20,688 9 7

RAMCOMUL SEN,

Officiating Secretary Asiatic Society.

CALCUTTA,

31st December, 1838.

*Meteorological Register, kept at the Assay Office, for the Month of January, 1839.*

Day of the Month.	Forenoon, 10 A. M.										Afternoon 4 P. M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	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By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	Old Stand	Height at 32 Fath.	River water.	Well water.	Air.	Dew point.	Depression.	Differential thermometer.	Hair Hygrometer.	By Wet bulb.	By Hair Hygrometer.	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